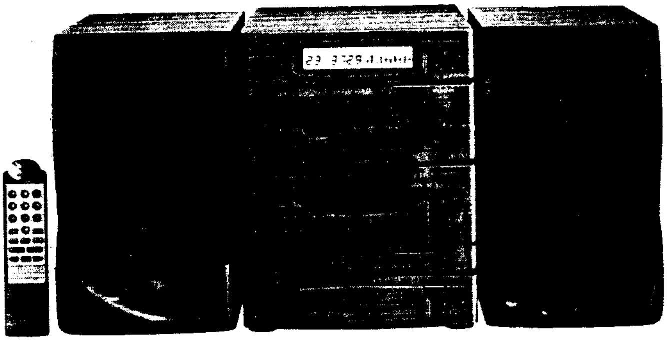
Mini System FW46/20/21/22/25/34

Service
Service
Service



Service Manual

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PHILIPS

CONNECTIONS AND CONTROLS

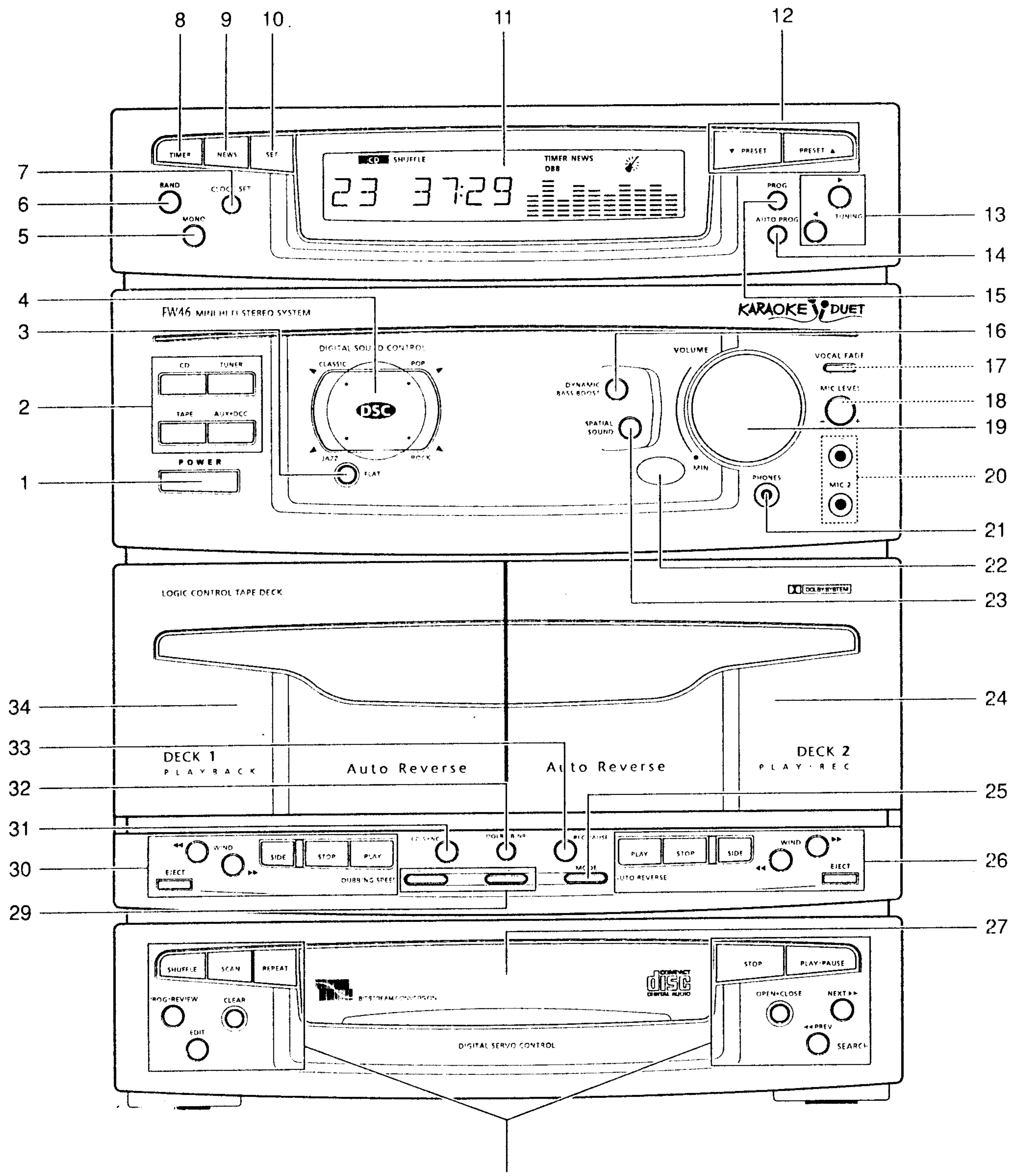

8
9
10
11
12
TIMER
NEWS
SET
CD SHUFFLE
TIMER NEWS
23 37:29
PRESET
PRESET
7
6
5
BAND
CLOCK SET
MONO
PROG
AUTO PROG
TUNING
13
14
15
4
3
FW46 MINI HI-FI STEREO SYSTEM
KARAOKE DUET
16
DIGITAL SOUND CONTROL
CLASSIC
POP
JAZZ
ROCK
DSC
FLAT
CD
TUNER
TAPE
AUX•DCC
POWER
2
1
DYNAMIC BASS BOOST
SPATIAL SOUND
VOLUME
MIN
VOCAL FADE
MIC LEVEL
PHONES
MIC 2
17
18
19
20
21
22
23
LOGIC CONTROL TAPE DECK
DOLBY SYSTEM
34
24
DECK 1
PLAYBACK
Auto Reverse
Auto Reverse
DECK 2
PLAY·REC
33
32
31
30
29
25
26
27
WIND
EJECT
SIDE
STOP
PLAY
CD SYNC
DOLBY B NR
REC PAUSE
DUBBING SPEED
MODE
AUTO REVERSE
SHUFFLE
SCAN
REPEAT
PROG·REVIEW
CLEAR
EDIT
COMPACT DISC DIGITAL AUDIO
DIGITAL SERVO CONTROL
STOP
PLAY·PAUSE
OPEN•CLOSE
NEXT
PREV
SEARCH
28

Figure 1

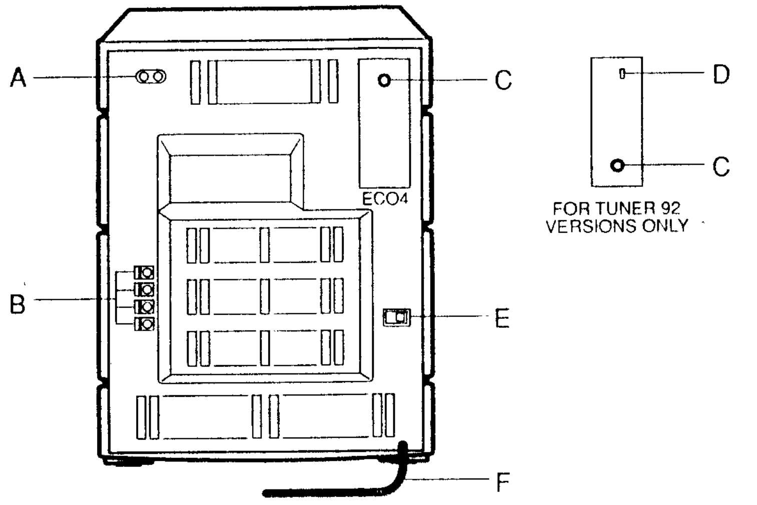

A
B
C
ECO4
E
F
D
C
FOR TUNER 92
VERSIONS ONLY

Figure 2

CONNECTIONS AND CONTROLS

1	Power		1414
2	Function controls	CD	1421
		Tuner	1426
		Tape	1420
		Aux-DCC	1410
3	Flat		1430
4	Digital Sound Control	Classic	1431
		Pop	1432
		Jazz	1433
		Rock	1434
5	Mono		1419
6	Band		1425
7	Clock set		1418
8	Timer		1424
9	News		1423
10	Set		1422
11	LCD display		1401
12	Preset up/down		1429, 1428
13	Tuning up/down		1412, 1416
14	Auto program		1417
15	Program		1413
16	Dynamic bass boost		1411
17 *	Vocal fade		1553
18 *	Mic level		3673
19	Volume		3629
20 *	Mic inputs		1551, 1562
21	Headphone socket		1550
22	IR sensor		6406
23	Spatial Sound		1415
24	Cassette compartment 2		
25	Mode		1471
26	Rec/Pb Deck controls	Play	1468
		Stop	1470
		Side	1469
		Wind <<	1467
		Wind >>	1466
		Eject	
27	CD Tray		
28	CD controls	Shuffle	1450
		Scan	1451
		Repeat	1459
		Program/Review	1458
		Edit	1454
		Clear	1455
		Stop	1456
		Play/Pause	1460
		Open/Close	1452
		Next	1461
		Previous	1457
29	Dubbing speed	Normal	1472
		High	1473
30	Play Deck controls	Eject	
		Wind <<	1479
		Wind >>	1478
		Side	1481
		Stop	1474
		Play	1480
31	CD Sync		1475
32	Dolby B NR		1477
33	Record/Pause		1476
34	Cassette compartment 1		
A	Aux-TV input		1552
B	Loudspeaker sockets		1304
C	FM antenna socket		110 1 o: 1110
D	AM antenna socket		1111
E	Voltage selector		1281
F	Mains cord		

* For Karaoke version only

SERVICE TEST PROGRAM 1

Operating sequence	Display shows	Remarks	In case of problems check
Hold "Program" and "Preset Up" button down while Power on to enter Service test program.	XX YY-S # This is the main menu.	where: XX - Type no. numeric YY - Master µP version S - Service mode	
Press "Program"	P Main menu reappears after 2 seconds.	Eeprom test	Check IC if Display shows ERR or N
Press "Autoprogram"	N Main menu reappears after 2 seconds.	Eeprom is now reset to default data.	
Press "Clock Set"	32	The Alarm buzzer is turned on. An output signal of 4096Hz is available at pin 37 of µProcessor.	Check X'tal
Press "Clock Set"	8	The output signal at pin 37 is now 3906.25Hz.	Check 8MHz oscillator
Press "Clock Set"	Main menu reappear.		
Press "Set Timer/News"	F N Main menu reappears after 2 seconds.	Pressing "Set Timer/News" key will alternate between Fast and Normal speed. In the Fast mode the clock increases at 1 minute per second. Leaving the test program now will allow quick customer checks on the clock/timer/alarm function.	Ensure the clock is in normal speed before returning to customer.
Press "Mono" and followed by any key on the set or Remote control. Press "Mono" to return to Main menu	See key test Table 1 and 2.		
Press "Tuning Up"	U	Volume turns clockwise slowly until maximum.	
Press "Tuning Down"	D	Volume turns anti-clockwise until minimum.	
Press "News"	Figure 3-6 and Main menu.	Pressing the "News" key will scroll through the 4 different displays and the Main menu.	
Press "Timer"	AUX TAPE CD TUNER Main menu reappears after 2 seconds.	During source switching the set is not muted.	
Disrupt the mains supply to exit the Service test program.			Ending the Service test by pressing the "Power" key will render: * CD error codes to be displayed. * Tuner "Program" and "Autoprogram" keys non functioning.

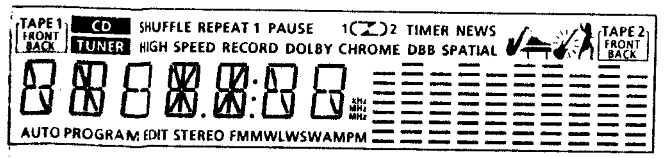

TAPE 1 FRONT BACK
CD
TUNER
SHUFFLE REPEAT 1 PAUSE
TIMER NEWS
HIGH SPEED RECORD DOLBY CHROME DBB SPATIAL
TAPE 2 FRONT BACK
AUTO PROGRAM EDIT STEREO FM MW LW SW AM PM

Figure 3

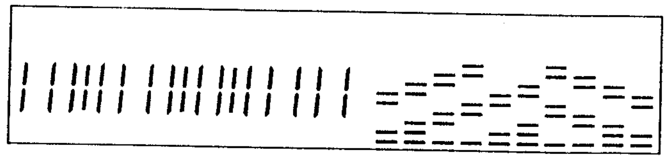


Figure 4

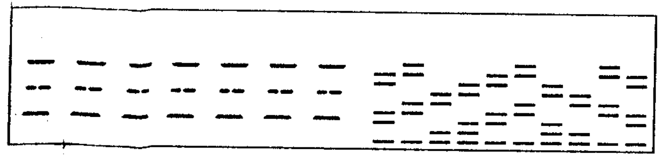


Figure 5

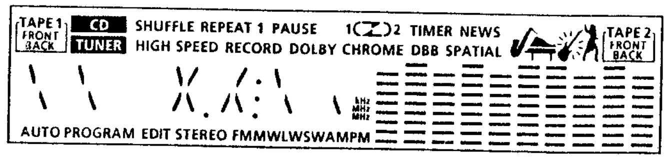

TAPE 1 FRONT BACK
CD
TUNER
SHUFFLE REPEAT 1 PAUSE
TIMER NEWS
HIGH SPEED RECORD DOLBY CHROME DBB SPATIAL
TAPE 2 FRONT BACK
AUTO PROGRAM EDIT STEREO FM MW LW SW AM PM

Figure 6

Note: XX - Model model (eg 46 for FW46, etc.)
YY - Software verstion, counting down from 99

SERVICE TEST PROGRAM 2

Operating sequence	Display shows	Remarks	In case of problems check
To perform CD test press "CD" at the Main menu screen.	CD AA	The CD servo version is display. AA = version number	Press "Power" key at the Main menu screen to exit Service test. Enter CD mode and the set perform as normal except error codes will be displayed A list of error codes are found in Table 4.
Press "Stop" - Service pos 0	S	During this test the sledge will move outward.	
Press "Next" - Service pos 1	F	Focus is switched on.	
Press "Next" - Service pos 2	D	Disc motor is switched on.	
Press "Next" - Service pos 3	R	Radial is switched on.	
Pressing "Previous" will bring the set to the previous service pos.			
To perform Tuner test press "Tuner" at the Main menu screen.	ZZZ	Tuner version is display. ZZZ = Tuner version	
Use the "Preset Up" and "Preset down" to display the loaded frequencies.	See Table 3.	Service frequencies are now loaded into the EEROM of the µProcessor.	
To end the Service test program disrupt the mains supply.			Ending the Service test by pressing the "Power" key will render: * CD error codes to be displayed. * Tuner "Program" and "Autoprogram" keys non functioning

TABLE 1. SERVICE KEY TEST TABLE

Timer/News/Tuner/ Function keys	Display	CD/Tape Keys	Display	CD keys	Display
Timer	14	Wind A <<	34	Shuffle	61
News	15	Wind A >>	33	Scan	62
Set	16	Side A	36	Repeat	54
Band	13	Stop A	37	Prog-Review	53
Clock Set	12	Play A	35	Clear	58
Mono	11	CD Sync	38	Edit	57
Preset Down	17	Dolby B NR	40	Stop	59
Preset Up	18	Rec-Pause	39	Play-Pause	55
Prog	01	Normal Speed	43	Open-Close	63
Autoprog	05	High Spead	44	Next	56
Tuning Up	02	Mode	42	Previous	60
Tuning Down	06	Play B	47		
CD	09	Stop B	41		
Tuner	20	Side B	48		
Tape	10	Wind B <<	46		
Aux-DCC	04	Wind B >>	45		
Power	08				
Classic	23				
Pop	22				
Jazz	21				
Rock	25				
Flat	24				
Dynamic Bass Boost	03				
Spatial Sound	07				

TABLE 2. SERVICE REMOTE CONTROL KEY TEST TABLE

Function/Tuner keys	Display	CD keys	Display	Tape keys	Display
Standby		CD	09	Tape 1	50
Sleep	28	Previous	30	Tape 2	51
News	15	Next	29	Side	67
DSC	68	Search -	32	Rewind	66
Volume -	70	Pause	27	F. Forward	65
Volume +	69	Search +	31	Stop	64
Tuner	20	Stop	59	Play	52
Preset Down	17	Play	26		
Preset Up	18				
Tuning Down	06				
Tuning Up	02				

TABLE 3. TUNER SERVICE TEST FREQUENCIES

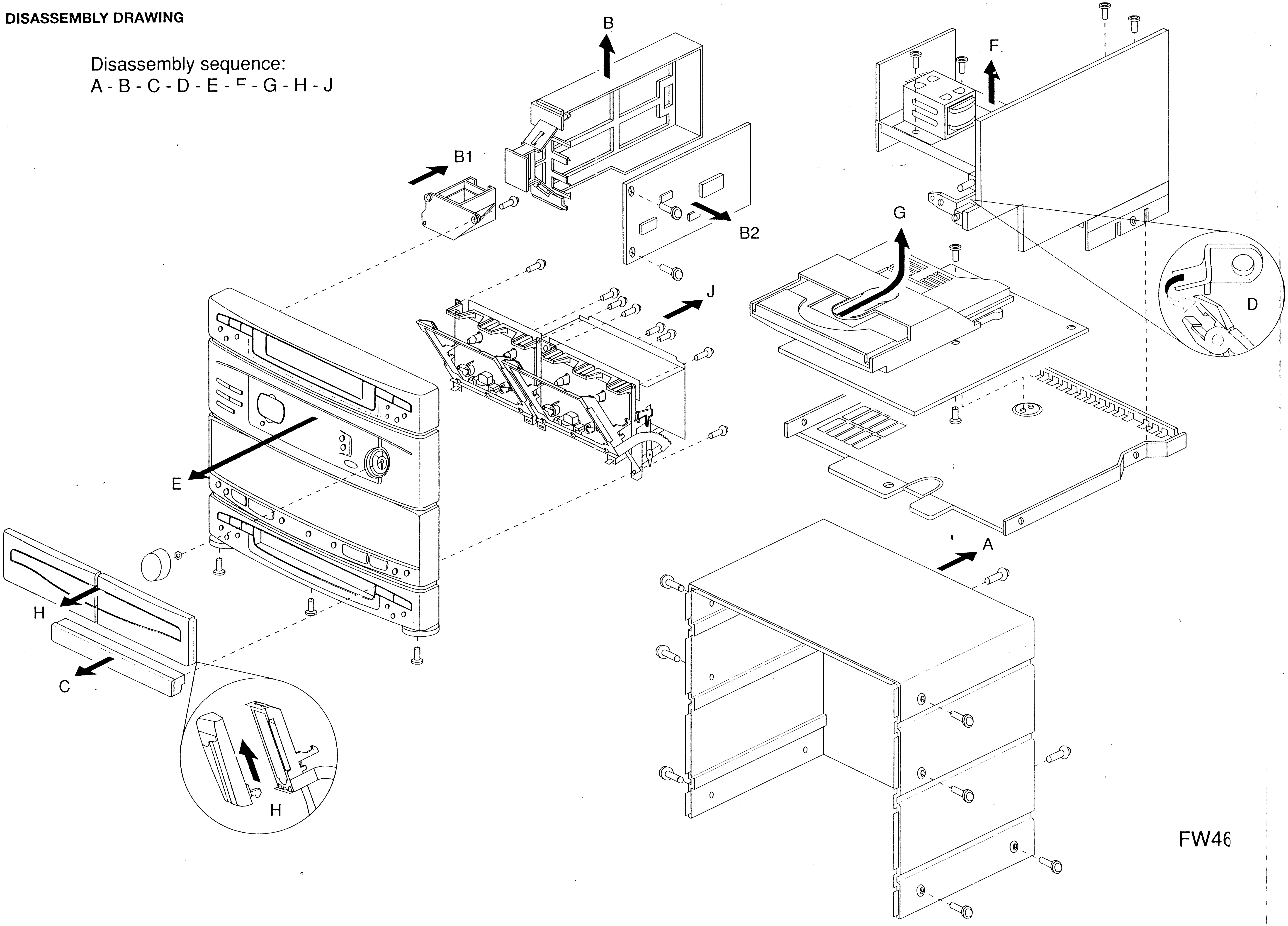
PRESET	Europe "EUR"	East Eur. "EAS"	USA "USA"	Oversea "OSC"	Japan "JAP"
1	108.00 MHz	108.00 MHz	108.00 MHz	108.00 MHz	90.00 MHz
2	87.50 MHz	65.81 MHz	87.50 MHz	87.50 MHz	76.00 MHz
3	1611 kHz	1611 kHz	1710 kHz	1710 kHz	1629 kHz
4	522 kHz	522 kHz	530 kHz	530 kHz	522 kHz
5	279 kHz	279 kHz	-	-	-
6	153 kHz	153 kHz	-	-	-
7	98.00 MHz	98.00 MHz	98.00 MHz	98.00 MHz	80.00 MHz
8	558 kHz	558 kHz	560 kHz	560 kHz	558 kHz
9	1494kHz	1494kHz	1500kHz	1500kHz	1494kHz
10	549kHz	549kHz	550kHz	550kHz	549kHz

TABLE 4. CD ERROR CODES TABLE

Error codes	Check area	Remarks
E 1002	ICs 7000, 7060 and 7080	Focus error, no disc
E 1007	CDM 12 and Disc	Subcode error, no valid subcode
E 1008	Bad Disc and Lens	TOC error, out of lead-in area while reading TOC
E 1009	IC 7101 and 7102	CD4 + decoder error
E 1010	IC 7000 and 7080	Radial error
E 1012	ICs 7000 and 7660	Fatal sledge error
E 1013	ICs 7102, 7140, 7141 and 7660	Turntable motor error
E 1030	CDM 12 and IC 7000	Too many grooves to jump
E 1031	CDM 12 and IC 7000	Search error
E 1032	CDM 12 and IC 7000	Search binary error
E 1033	CDM 12 and IC 7000	Search index error
E 1034	CDM 12 and IC 7000	Search time error
E 1037	CDM 12 and IC 7000	Selection error
E 1050	Operating error	Edit calculation error
E 1051	Operating error	Edit track count error
E 1052	Operating error	Edit optimal error

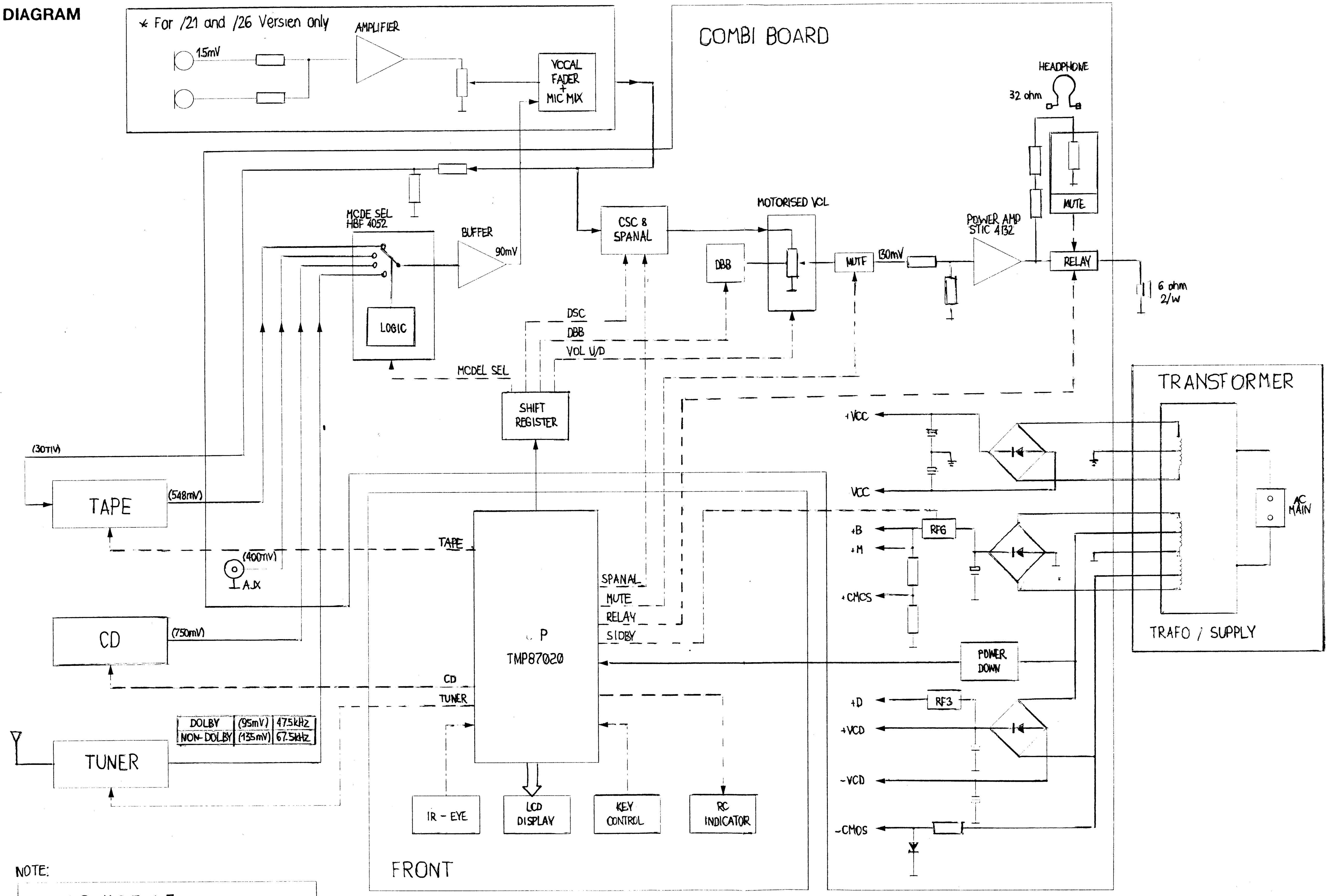
DISASSEMBLY DRAWING

Disassembly sequence:
A - B - C - D - E - F - G - H - J


B
B1
B2
F
G
D
J
E
H
C
H
A

FW46

BLOCK DIAGRAM

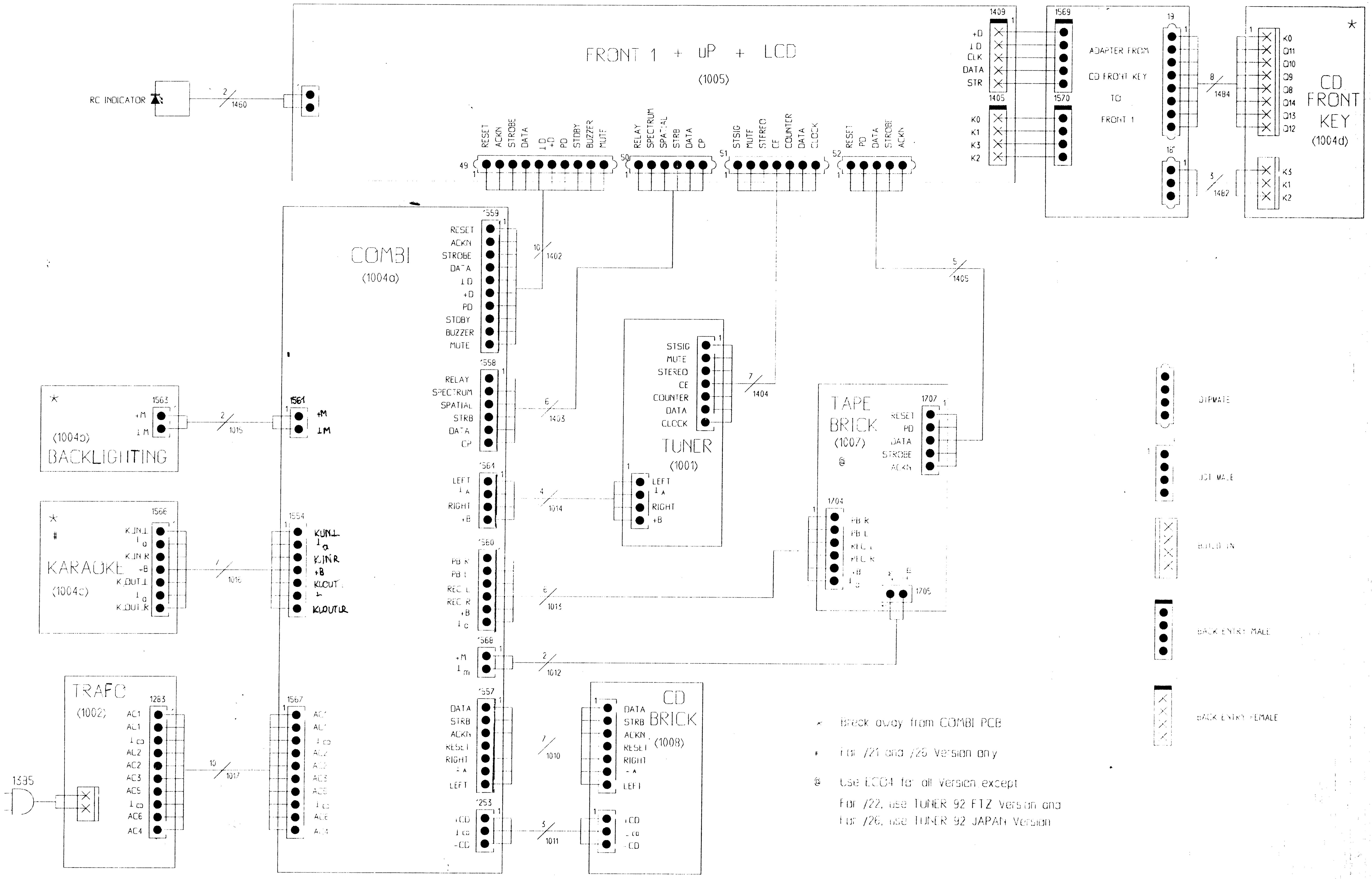

* For /21 and /26 Version only
AMPLIFIER
1.5mV
VOCAL FADER + MIC MIX
COMBI BOARD
HEADPHONE
32 ohm
MUTE
MODE SEL HBF 4052
BUFFER
90mV
LOGIC
CSC & SPANAL
MOTORISED VOL
DBB
MUTE
130mV
POWER AMP STIC 4132
RELAY
6 ohm 2/W
DSC
DBB
VOL U/D
MODEL SEL
SHIFT REGISTER
TRANSFORMER
+VCC
VCC
+B
+M
+CMOS
RFG
POWER DOWN
+D
RF3
+VCD
-VCD
-CMOS
AC MAIN
TRAFO / SUPPLY
(30mV)
TAPE
(548mV)
(400mV)
AUX
CD
(750mV)
TUNER
DOLBY
NON-DOLBY
(95mV)
(135mV)
47.5kHz
67.5kHz
TAPE
SPANAL
MUTE
RELAY
STDBY
µP
TMP87020
CD
TUNER
IR - EYE
LCD DISPLAY
KEY CONTROL
RC INDICATOR
FRONT

NOTE:

TUNER MODULE

EC04 for all Version except
For /22, use TUNER 92 with FTZ Version and
For /26, use TUNER 92 JAPAN Version

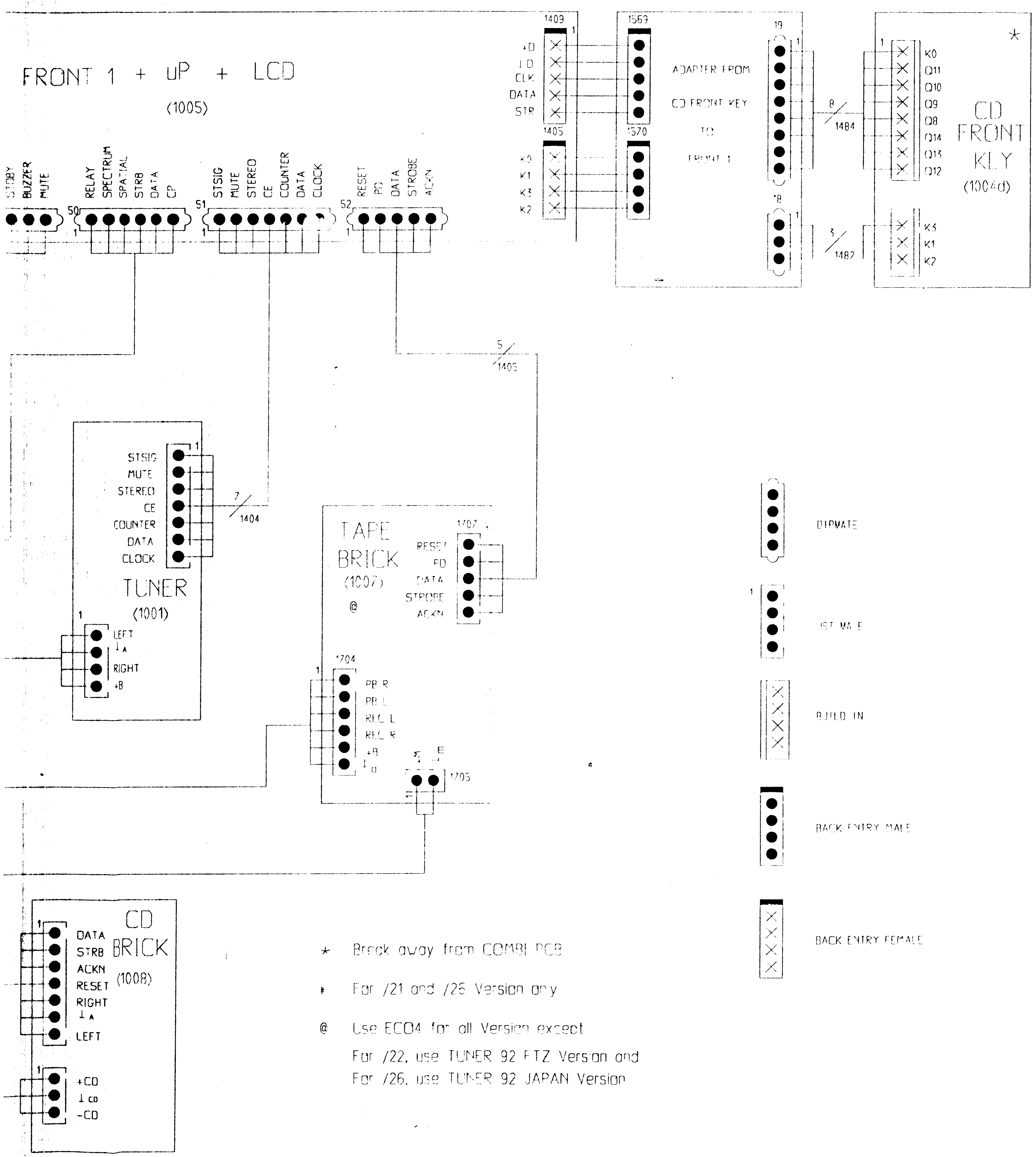
WIRING DIAGRAM


FRONT 1 + uP + LCD
(1005)
RC INDICATOR
2 1460
1409
+D
⊥D
CLK
DATA
STR
1405
K0
K1
K3
K2
1569
1570
ADAPTER FROM
CD FRONT KEY
TO
FRONT 1
19
16
8 1484
3 1482
K0
Q11
Q10
Q9
Q8
Q14
Q13
Q12
K3
K1
K2
CD
FRONT
KEY
(1004d)
49
RESET
ACKN
STROBE
DATA
⊥D
+D
PD
STDBY
BUZZER
MUTE
50
RELAY
SPECTRUM
SPATIAL
STRB
DATA
CP
51
STSIG
MUTE
STFREQ
CE
COUNTER
DATA
CLOCK
52
RESET
PD
DATA
STROBE
ACKN
COMBI
(1004a)
1559
RESET
ACKN
STROBE
DATA
⊥D
+D
PD
STDBY
BUZZER
MUTE
10 1402
1558
RELAY
SPECTRUM
SPATIAL
STRB
DATA
CP
6 1403
1564
LEFT
⊥A
RIGHT
+B
4 1014
1560
PB R
PB L
REC L
REC R
+B
⊥C
6 1013
1568
+M
⊥m
2 1012
1557
DATA
STRB
ACKN
RESET
RIGHT
⊥A
LEFT
7 1010
1253
+CD
⊥CD
-CD
3 1011
5 1405
TUNER
(1001)
STSIG
MUTE
STEREO
CE
COUNTER
DATA
CLOCK
7 1404
LEFT
⊥A
RIGHT
+B
TAPE
BRICK
(1007)
@
1707
RESET
PD
DATA
STROBE
ACKN
1704
PB R
PB L
REC L
REC R
+B
⊥C
1705
(1004b)
BACKLIGHTING
1563
+M
⊥M
2 1015
1561
+M
⊥M
KARAOKE
(1004c)
#
1566
KJNL
⊥a
KJNR
+B
KOUTL
⊥a
KOUTR
1016
1554
KJNL
⊥a
KJNR
+B
KLOUT
⊥
KLOUTR
TRAFO
(1002)
1263
AC1
AL1
⊥CD
AL2
AC2
AC3
AC5
⊥CD
AC6
AC4
10 1017
1567
1335
CD
BRICK
(1008)
DATA
STRB
ACKN
RESET
RIGHT
⊥A
LEFT
+CD
⊥CD
-CD
DIPMATE
JST MALE
BUILD IN
BACK ENTRY MALE
BACK ENTRY FEMALE

★ Break away from COMBI PCB

For /21 and /25 Version only

@ Use 1004 for all Version except
For /22, use TUNER 92 FTZ Version and
For /26, use TUNER 92 JAPAN Version


FRONT 1 + uP + LCD
(1005)
STDBY
BUZZER
MUTE
RELAY
SPECTRUM
SPATIAL
STRB
DATA
CP
STSIG
MUTE
STEREO
CE
COUNTER
DATA
CLOCK
RESET
PD
DATA
STROBE
ACKN
50
51
52
1409
1569
1405
1570
ADAPTER FROM CD FRONT KEY TO FRONT 1
19
8
1484
3
1482
CD FRONT KEY
(1004d)
K0
Q11
Q10
Q9
Q8
Q14
Q13
Q12
K3
K1
K2
5
1403
TUNER
(1001)
LEFT
RIGHT
+B
7
1404
TAPE BRICK
(1007)
1707
RESET
PD
DATA
STROBE
ACKN
1704
PB R
PB L
REC L
REC R
+B
1705
CD BRICK
(1008)
DATA
STRB
ACKN
RESET
RIGHT
LEFT
+CD
⊥ CD
-CD
DIPMATE
1ST MALE
BUILD IN
BACK ENTRY MALE
BACK ENTRY FEMALE

★ Break away from COMBI PCB

⁑ For /21 and /26 Version only

@ Use ECO4 for all Version except
For /22, use TUNER 92 FTZ Version and
For /26, use TUNER 92 JAPAN Version

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

ESD

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della piu grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

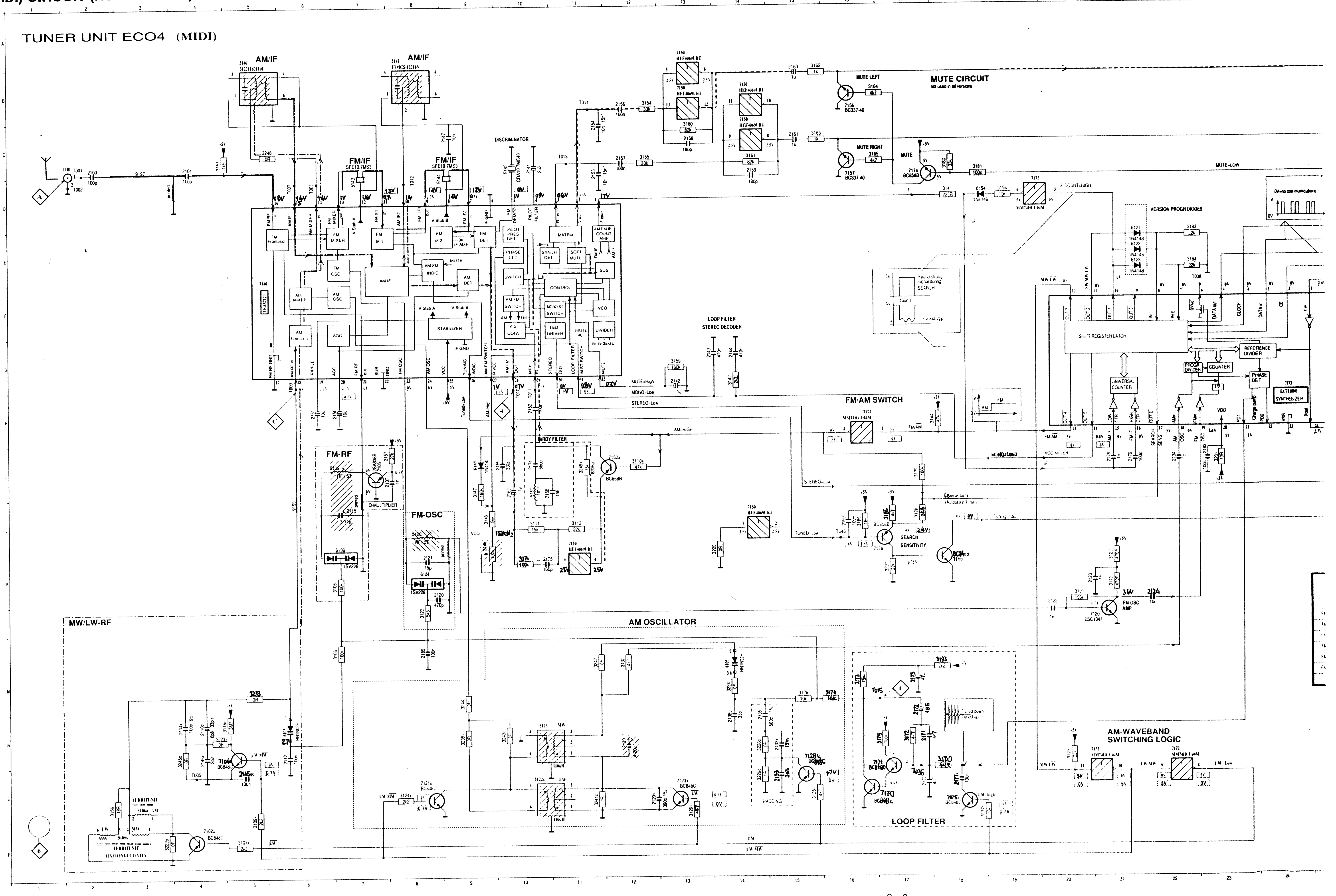
(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

EC04 (MIDI) CIRCUIT (Not for /22/26)


TUNER UNIT ECO4 (MIDI)
AM/IF
5140
AM/IF
5142
FM/IF
SFE10.7MS3
FM/IF
SFE10.7MS3
DISCRIMINATOR
CDA10.7MC40
MUTE CIRCUIT
not used in all versions
MUTE LEFT
MUTE RIGHT
MUTE
7156
BC337-40
7157
BC337-40
7174
BC858B
MUTE+LOW
IF COUNT=HIGH
VERSION PROGR DIODES
1N4148
FM Frontend
FM MIXER
FM IF 1
FM IF 2
FM DET
FM OSC
AM IF
AM FM INDIC
AM DET
AM MIXER
AM OSC
AM Frontend
AGC
STABILIZER
PILOT PRES DET
PHASE DET
SWITCH
AM FM SWITCH
V.S. COMP
MATRIX
SYNCH DET
SOFT MUTE
CONTROL
MONO ST SWITCH
LED DRIVER
AM FM IF COUNT AMP
SDS
VCO
DIVIDER
MUTE
LOOP FILTER
STEREO DECODER
7140
TEA5712
FM-RF
Q MULTIPLIER
FM-OSC
1SV228
BIRDY FILTER
BC858B
FM/AM SWITCH
MM74HC U04M
SEARCH SENSITIVITY
BC848B
TUNED=Low
STEREO=Low
MONO=Low
MUTE=High
AM=High
SHIFT REGISTER LATCH
REFERENCE DIVIDER
PROGR DIVIDER
COUNTER
PHASE DET
UNIVERSAL COUNTER
7173
LC7218M
SYNTHESIZER
CLOCK
DATA in
DATA out
CE
VDD
VSS
FM OSC AMP
7120
2SC1047
AM OSCILLATOR
MW/LW-RF
FERRITUNIT
FIXED INDUCTIVITY
7102
BC848C
7104
BC848
7121
BC848C
7123
BC848C
PADDINGS
LOOP FILTER
7170
BC848C
7171
BC848B
7179
BC848
AM-WAVEBAND SWITCHING LOGIC
MM74HC U04M
LW=Low
MW/LW
A
B
C
D
E
F
G
H
J
K
L
M
N
O
P
1
2
3
4
5
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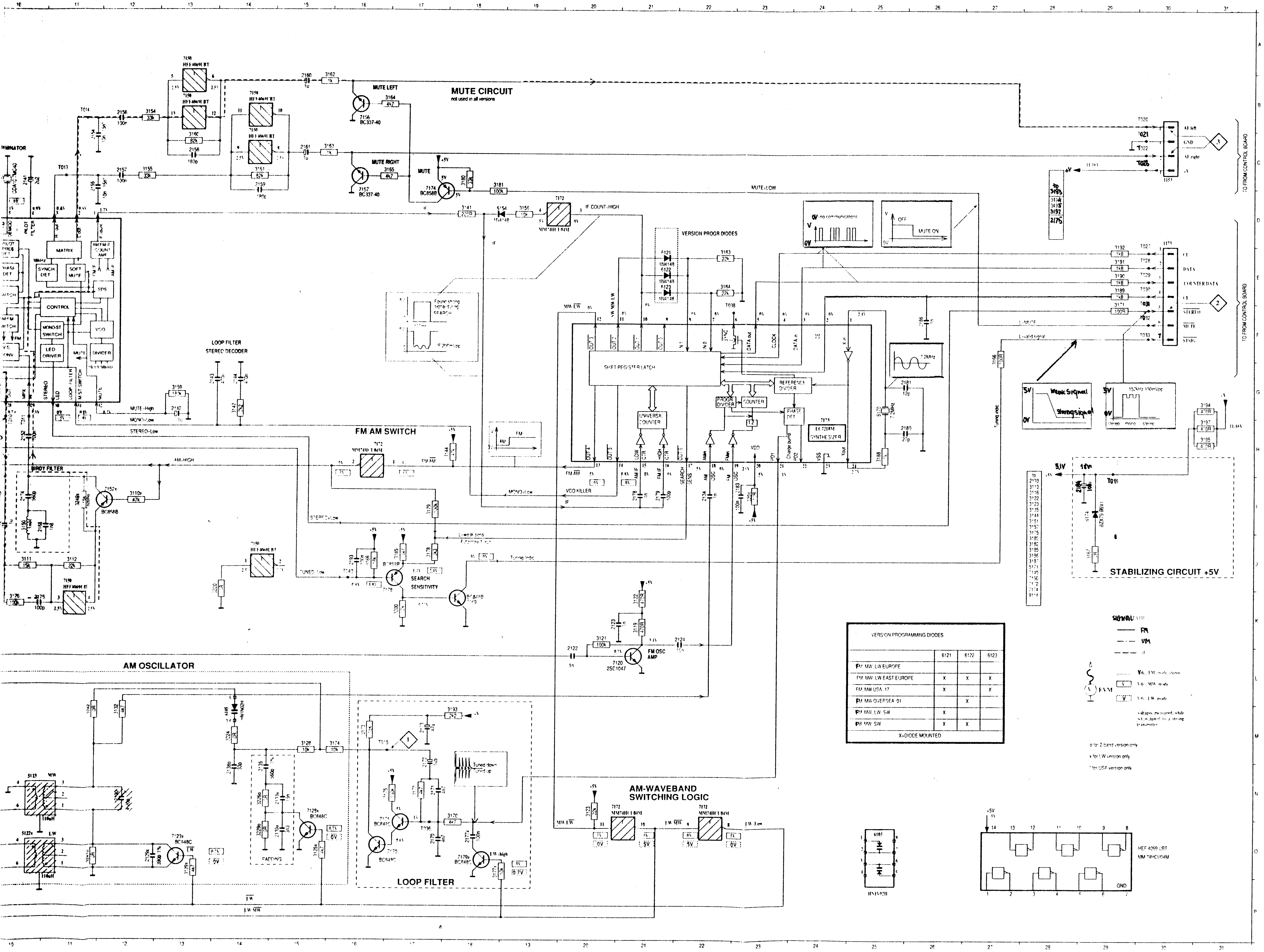

MUTE CIRCUIT
not used in all versions
MUTE LEFT
MUTE RIGHT
MUTE
MUTE-LOW
BC337-40
BC858B
HEF4066UBT
LOOP FILTER
STEREO DECODER
MATRIX
SYNCH DET
SOFT MUTE
SDS
CONTROL
MONO/ST SWITCH
VCO
LED DRIVER
DIVIDER
PILOT FILTER
MUTE-High
MONO-Low
STEREO-Low
FM AM SWITCH
AM-HIGH
BIRDY FILTER
IF COUNT-HIGH
VERSION PROGR DIODES
1N4148
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
REFERENCE DIVIDER
PROGR DIVIDER
COUNTER
PHASE DET
SYNTHESIZER
DATA out
CLOCK
DATA in
VCO KILLER
SEARCH SENSITIVITY
TUNED-Low
Tuning indic
FM OSC AMP
2SC1047
AM OSCILLATOR
PADDING
LOOP FILTER
Tuned down
AM-WAVEBAND SWITCHING LOGIC
MM74HCU04M
MW
LW
LW-high
AF left
GND
AF right
CE
DATA
COUNTER DATA
STEREO
MUTE
SSIG
TO FROM CONTROL BOARD
no communications
OFF
MUTE ON
Weak Signal
Strong signal
STABILIZING CIRCUIT +5V
HEF 4066 UBT
MM 74HCU04M
GND
SIGNAL
FM
VM
EVM
Vdc FM mode stereo
Vdc MW mode
Vdc LW mode
voltages measured while set is tuned to a strong transmitter

VERSION PROGRAMMING DIODES	6121	6122	6123
FM. MW. LW EUROPE			
FM. MW. LW EAST EUROPE	X	X	X
FM. MW USA 17	X		X
FM. MW OVERSEA 01		X	
FM. MW. LW. SW	X		
FM. MW. SW	X	X	
X=DIODE MOUNTED			

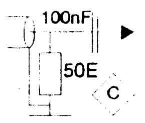
o for 2-band version only

x for LW version only

* for USA version only

1101	C 2
1153	C30
1173	D30
2100	C 2
2104	C 4
2107	I 8
2110o	N 4
2112	N 6
2114x	N 4
2115	J 7
2120	K 8
2121	K 8
2122	K20
2123	K20
2124	K22
2129x	O12
2130	N12
2133x	N15
2134	I22
2135	N14
2138o	N14
2139x	O15
2141	C10
2142	G13
2143	G13
2144	G14
2145x	O 5
2146x	N 4
2147	C 9
2150	H 7
2151	H 6
2152	H10
2154	C11
2155	C11
2156	B12
2157	C12
2158	C13
2159	C14
2160	B15
2161	C15
2162	I10
2168	I10
2169	I10
2170	O17
2171	N17
2172	M17
2173	M17
2174	I10
2175	K10
2177x	O18
2178	I21
2179	I21
2180	H25
2181	G25
2183	I23
2184	I29
2185	L 8
2186	F26
2193	J16
3106	L 7
3107x	P 5
3108	K 7
3109x	O 5
3110x	I12
3111	J10
3112	J11
3116x	L 4
3119	K21
3120	L 8
3121	K20
3122	K21
3123	N20
3124x	O 8
3125x	O15
3128	M15
3129x	O13
3132	M12
3141	D18
3142	G14
3144	H18
3147	I 9
3148	J 9
3149	J 9
3151	C 4
3154	B12
3155	C12
3156	D19
3157	I 7
3158x	O 2
3159	G13
3160	C13
3161	C14
3162	B15
3163	C15
3164	B16
3165	C16
3166	F27
3167	J29
3170	N18
3171	F29
3172	N17
3173	M16
3174	M16
3175	N17
3176	K10
3177x	O18
3178	J17
3179	I17
3180	C18
3181	C18
3183	E22
3184	E22
3185	J17
3186	J16
3188	H25
3189	E29
3190	E29
3191	E29
3192	E29
3193	M18
3194	G31
3195	H31
3197	H31
3200	K17
3201	I23
3220	J14
3222o	P 3
3223x	N 4
3224	M14
3226o	N14
3229o	O14
3233	M 5
3238x	N 9
3241o	O11
3242	M11
3243o	N10
3244	M 9
3245o	N 4
3248	C 5
3249x	I11
5105x	P 2
5106o	C 3
5109	I 7
5120	J 8
5122x	O10
5123	N10
5140	A 5
5142	A 8
5143	D 7
5144	D 9
5145	C10
5150	I10
5170	G25
6105	O25
6109	J 7
6121	E21
6122	E21
6123	E21
6124	K 8
6140	I 9
6154	D18
6174	I29
7102x	P 4
7104x	N 5
7105	I 7
7120	L20
7121x	O 8
7123x	O13
7128x	N15
7140	E 5
7150	J14
7150	J11
7150	A13
7150	C14
7150	B14
7150	B13
7152x	I12
7156	B16
7157	C16
7169	K18
7170	O17
7171	O17
7172	H16
7172	D20
7172	O20
7172	N22
7172	N20
7172	O22
7173	H24
7174	D17
7178	K16
7179x	O18
9197	C 3
9199	J 6
T001	C 2
T002	D 2
T005	C 4
T007	D 6
T008	D 6
T009	G 6
T010	H10
T011	H10
T012	C 8
T013	C11
T014	B11
T015	M16
T016	I29
T020	B29
T021	C29
T022	C29
T023	C29
T027	D30
T028	E30
T029	E30
T030	E30
T031	E30
T032	F30
T033	F30
T036	O17
T038	F22
T040	J16

TUNER Adjustment table (ECO 4 FM/MW- and FM/MW/LW - versions with AM-ferrite antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT $^{*\,1)}$						
FM 87.5 - 108MHz			108 MHz	5120	1	8V ± 0.2V
			87.5MHz	check		4.1V ± 0.5V
FM /14 East Europe 65.81 - 108MHz			108 MHz	5120		8V ± 0.2V
			65.81 MHz	check		0.8V ± 0.4V
MW 2-band version, 10kHz grid 530 - 1710kHz			1710kHz	5123		9V±0.1V (7.5±0.7V)$^{1)}$
			530kHz	check		1V±0.4V (1.1±0.5V)$^{1)}$
LW 153 - 279kHz			279kHz	5122		8V±0.2V (7.5±1.5V)$^{1)}$
			153kHz	check		1V±0.4V (1.1±0.5V)$^{1)}$
MW 3-band version 522 - 1611kHz			1611kHz	5123		8V±0.1V (7.5±0.5V)$^{1)}$
			522kHz	check		1V±0.4V (1.1±0.5V)$^{1)}$
FM - RF						
FM	108MHz	A mod=1kHz Δf=22.5kHz	108MHz	2115	3	MAX ↕
	87.5MHz		87.5MHz	5109		
FM /14 East Europe	108MHz		108MHz	2115		
	65.81MHz		65.81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	A	98MHz	3148	2	152kHz ± 1kHz
AM - IF						
MW	540kHz Δf = 10kHz as low as possible	 100nF 50E C	540kHz	5142 5140	4	symmetrical and max height
AM - RF						
LW	198kHz	B mod=1kHz 30% AM	198kHz	5122	4	MAX
MW 3-band version	1494kHz		1494kHz	2130		MAX ↕
	549kHz		549kHz	5123		
MW 2-band version, 10kHz grid	1500kHz		1500kHz	2130		
	550kHz		550kHz	5123		

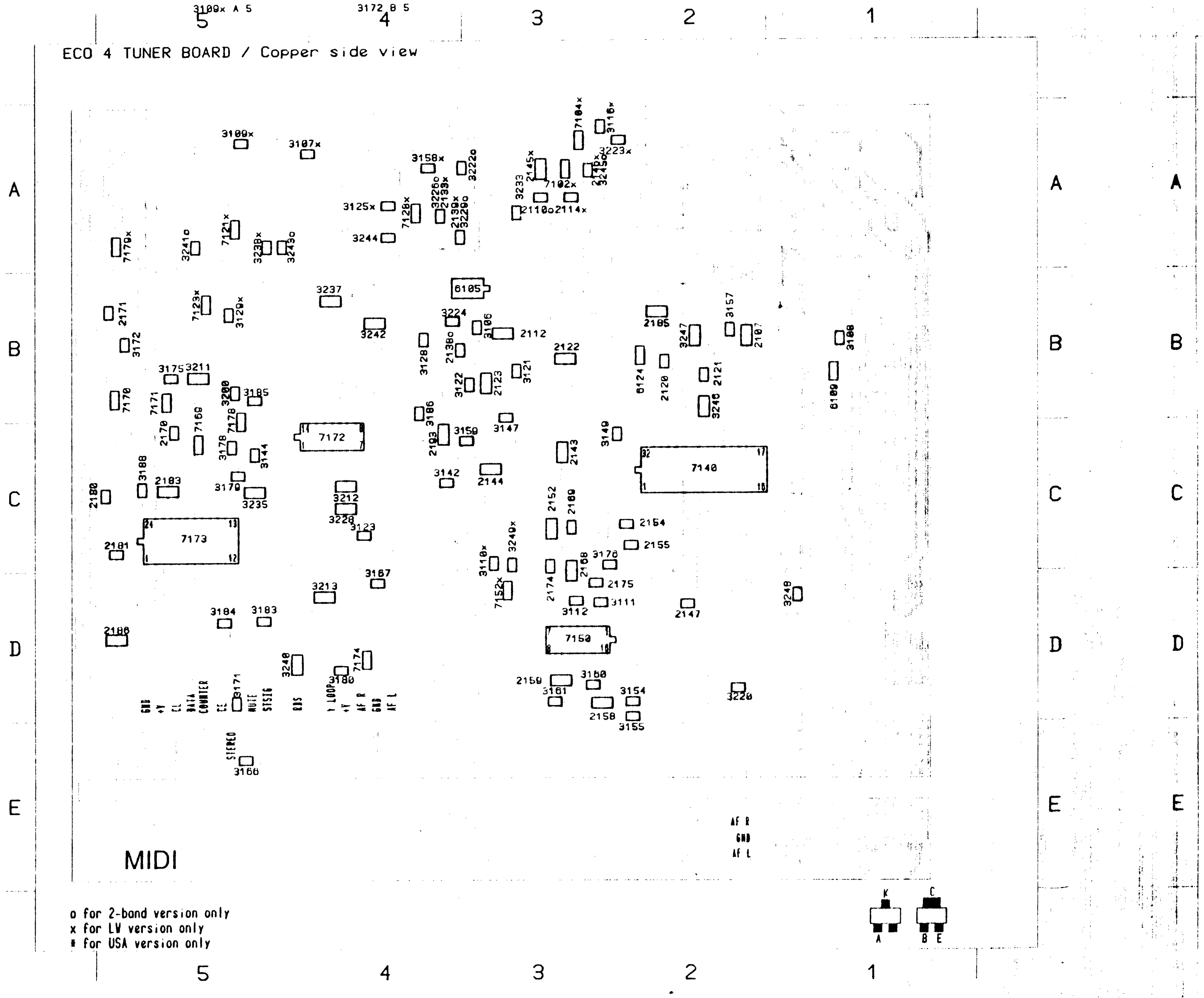
* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ. automatically.

[1] Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfils value stated within brackets after AM-RF adjustment.

↕ repeat

EC04 (MIDI) LAYOUT (Not for /22/26)

2107	B	2
2110o	A	3
2112	B	3
2114x	A	3
2120	B	2
2121	B	2
2122	B	3
2123	B	3
2133x	A	4
2138o	B	4
2139x	A	4
2143	C	3
2144	C	3
2145x	A	3
2146x	A	3
2147	D	2
2152	C	3
2154	C	2
2155	C	2
2158	D	3
2159	D	3
2168	D	3
2169	C	3
2170	C	5
2171	B	5
2174	C	3
2175	D	3
2180	C	5
2181	C	5
2183	C	5
2185	B	2
2186	D	5
2193	C	4
3106	B	3
3107x	A	5
3108	B	1
3109x	A	5
3110x	C	3
3111	D	3
3112	D	3
3116x	A	3
3121	B	3
3122	B	3
3123	C	4
3125x	A	4
3128	B	4
3129x	B	5
3142	C	4
3144	C	5
3147	B	3
3149	C	2
3154	D	2
3155	D	2
3157	B	2
3158x	A	4
3159	C	3
3160	D	3
3161	D	3
3166	E	5
3167	D	4
3171	D	5
3172	B	5
3175	B	5
3176	C	3
3178	C	5
3179	C	5
3180	D	4
3183	D	5
3184	D	5
3185	B	5
3186	B	4
3188	C	5
3200	B	5
3211	B	5
3212	C	4
3213	D	4
3220	D	2
3222o	A	3
3223x	A	2
3224	B	4
3226o	A	4
3228	C	4
3229o	A	4
3233	A	3
3235	C	5
3237	B	4
3238x	A	5
3240	D	5
3241o	A	5
3242	B	4
3243o	A	5
3244	A	4
3245o	A	3
3246	B	2
3247	B	2
3248	D	1
3249x	C	3
6105	B	3
6109	B	1
6124	B	2
7102x	A	3
7104x	A	3
7121x	A	5
7123x	B	5
7128x	A	4
7140	C	2
7150	D	3
7152x	D	3
7169	C	5
7170	B	5
7171	B	5
7172	C	4
7173	C	5
7174	D	4
7178	C	5
7179x	A	5
T001	A	1
T002	A	1
T005	D	1
T007	C	2
T008	D	1
T009	B	2
T010	C	3
T011	C	3
T012	C	2
T013	D	2
T014	D	2
T015	B	5
T016	A	5
T020	E	4
T021	D	3
T022	D	4
T023	D	4
T027	E	5
T028	E	5
T029	D	5
T030	D	5
T031	E	5
T032	E	5
T033	D	5
T036	B	5
T038	D	5
T040	B	4



o for 2-band version only
x for LV version only
* for USA version only

Scope / Voltmeter

8V ± 0.2V

4.1V ± 0.5V

8V ± 0.2V

0.8V ± 0.4V

V±0.1V (7.5±0.7V)[1]

V±0.4V (1.1±0.5V)[1]

V±0.2V (7.5±1.5V)[1]

V±0.4V (1.1±0.5V)[1]

V±0.1V (7.5±0.5V)[1]

V±0.4V (1.1±0.5V)[1]

MAX

152kHz ± 1kHz

symmetrical and max height

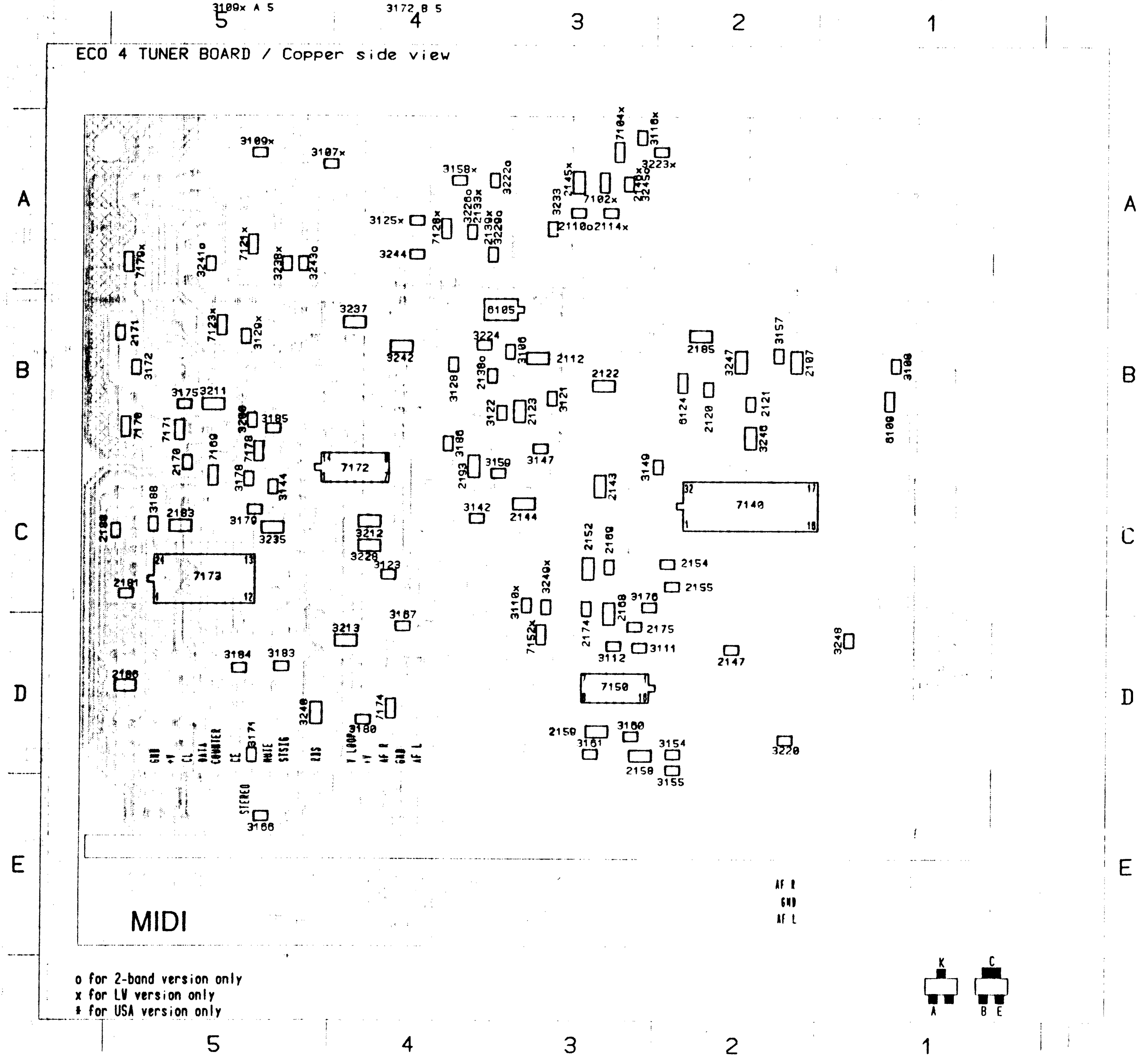
MAX

MAX

u. automatically.
e stated within

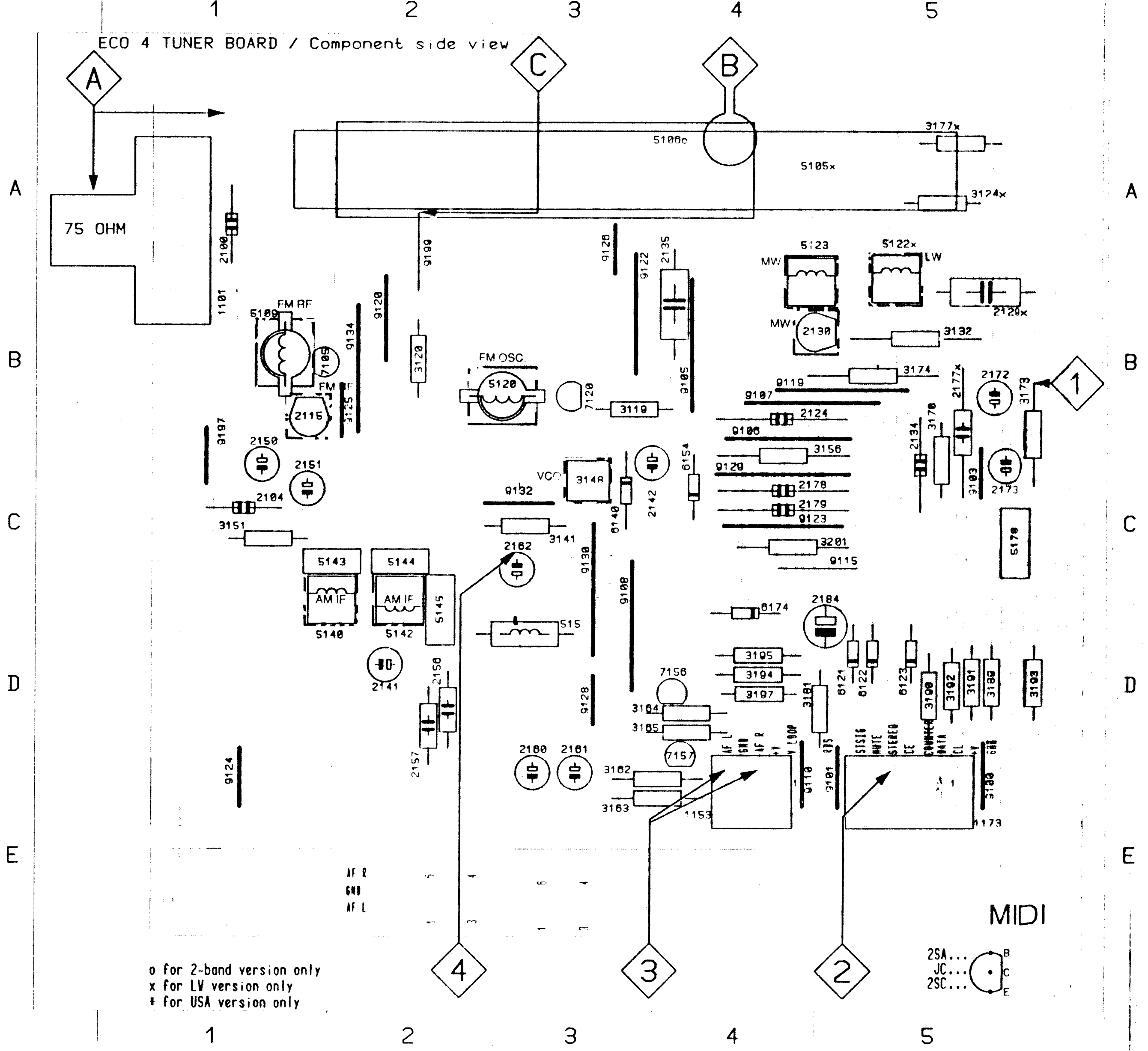
EC04 (MIDI) LAYOUT (Not for /22/26)

2107	B	2
2110o	A	3
2112	B	3
2114x	A	3
2120	B	2
2121	B	2
2122	B	3
2123	B	3
2133x	A	4
2130o	B	4
2139x	A	4
2143	C	3
2144	C	3
2145x	A	3
2146x	A	3
2147	D	2
2152	C	3
2154	C	2
2155	C	2
2158	D	3
2159	D	3
2160	D	3
2169	C	3
2170	C	5
2171	B	5
2174	C	3
2175	D	3
2180	C	5
2181	C	5
2183	C	5
2185	B	2
2186	D	5
2193	C	4
3106	B	3
3107x	A	5
3108	B	1
3109x	A	5
3110x	C	3
3111	D	3
3112	D	3
3116x	A	3
3121	B	3
3122	B	3
3123	C	4
3125x	A	4
3128	B	4
3129x	B	5
3142	C	4
3144	C	5
3147	B	3
3149	C	2
3154	D	2
3155	D	2
3157	B	2
3158x	A	4
3159	C	3
3160	D	3
3161	D	3
3166	E	5
3167	D	4
3171	D	5
3172	B	5
3175	B	5
3176	C	3
3178	C	5
3179	C	5
3180	D	4
3183	D	5
3184	D	5
3185	B	5
3186	B	4
3188	C	5
3200	B	5
3211	B	5
3212	C	4
3213	D	4
3220	D	2
3222o	A	3
3223x	A	2
3224	B	4
3226o	A	4
3228	C	4
3229o	A	4
3233	A	3
3235	C	5
3237	B	4
3238x	A	5
3240	D	5
3241o	A	5
3242	B	4
3243o	A	5
3244	A	4
3245o	A	3
3246	B	2
3247	B	2
3248	D	1
3249x	C	3
6105	B	3
6109	B	1
6124	B	2
7102x	A	3
7104x	A	3
7121x	A	5
7123x	B	5
7128x	A	4
7140	C	2
7150	D	3
7152x	D	3
7169	C	5
7170	B	5
7171	B	5
7172	C	4
7173	C	5
7174	D	4
7178	C	5
7179x	A	5
T001	A	1
T002	A	1
T005	D	1
T007	C	2
T008	D	1
T009	B	2
T010	C	3
T011	C	3
T012	C	2
T013	D	2
T014	D	2
T015	B	5
T016	A	5
T020	E	4
T021	D	3
T022	D	4
T023	D	4
T027	E	5
T028	E	5
T029	D	5
T030	D	5
T031	E	5
T032	E	5
T033	D	5
T036	B	5
T038	D	5
T040	B	4



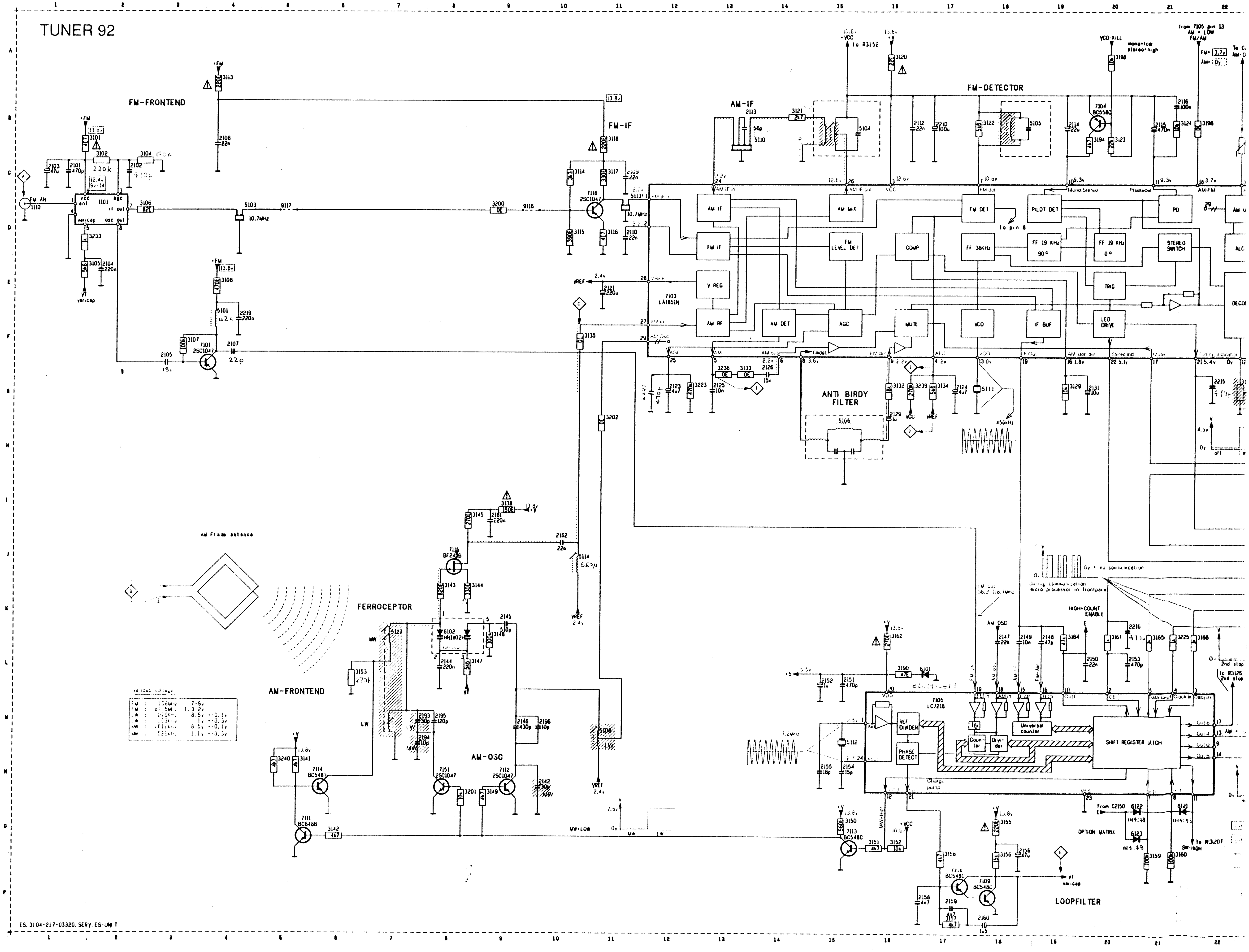
o for 2-band version only
x for LV version only
* for USA version only

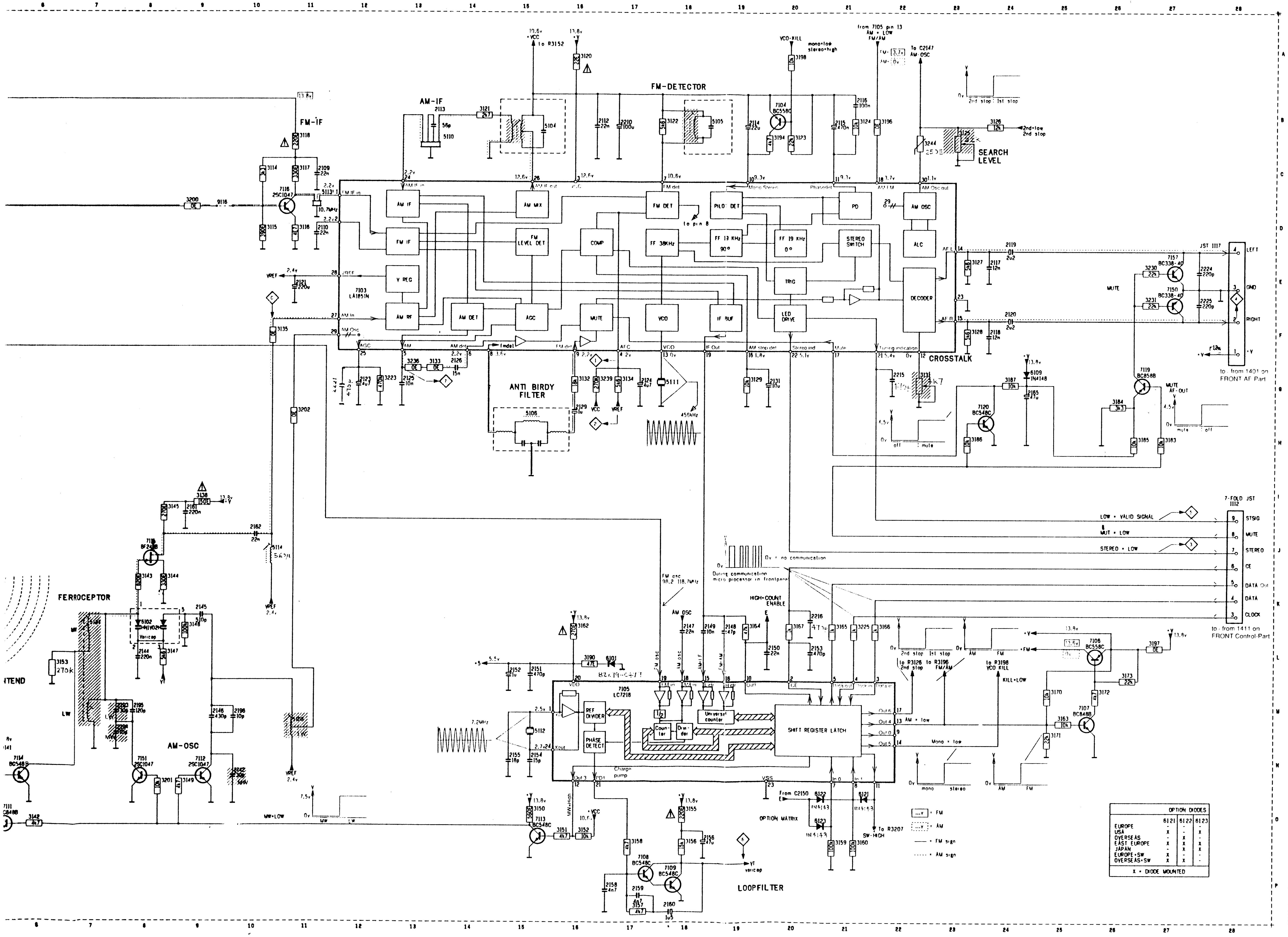
1101	A	1
1153	E	4
1173	E	5
2100	A	1
2104	C	1
2115	B	1
2124	B	4
2129x	B	5
2130	B	4
2134	C	5
2135	B	4
2141	D	2
2142	C	3
2150	C	1
2151	C	1
2156	D	2
2157	D	2
2160	E	3
2161	E	3
2162	C	3
2172	B	5
2173	C	5
2177x	B	5
2178	C	4
2179	C	4
2184	D	5
3119	B	3
3120	B	2
3124x	A	5
3132	B	5
3141	C	3
3148	C	3
3151	C	1
3156	C	4
3162	E	4
3163	E	4
3164	D	4
3165	D	4
3170	C	5
3173	B	5
3174	B	5
3177x	A	5
3181	D	5
3189	D	5
3190	D	5
3191	D	5
3192	D	5
3193	D	5
3194	D	4
3195	D	4
3197	D	4
3201	C	4
5105x	A	4
5106o	A	4
5109	B	1
5120	B	3
5122x	A	5
5123	B	4
5140	C	2
5142	C	2
5143	C	2
5144	C	2
5145	D	2
5150	D	3
5170	C	5
6121	D	5
6122	D	5
6123	D	5
6140	C	3
6154	C	4
6174	D	4
7105	B	1
7120	B	3
7156	D	4
7157	D	4
9100	E	5
9101	E	5
9103	C	5
9105	B	4
9106	B	4
9107	B	4
9108	D	3
9110	E	4
9115	C	5
9119	B	5
9120	B	2
9122	B	3
9123	C	4
9124	E	1
9125	B	2
9126	A	3
9128	D	3
9129	C	4
9130	C	3
9132	C	3
9134	B	2
9197	C	1
9199	A	2



o for 2-band version only
x for LV version only
* for USA version only

TUNER 92 CIRCUIT (For /22 only)


TUNER 92
FM-FRONTEND
FM-IF
AM-IF
FM-DETECTOR
ANTI BIRDY FILTER
FERROCEPTOR
AM-FRONTEND
AM-OSC
LOOPFILTER
AM Frame antenna
7103 LA1851N
7105 LC7218
AM IF
FM IF
V REG
AM RF
AM DET
AGC
AM MIX
FM LEVEL DET
COMP
MUTE
FM DET
FF 38KHz
VCO
PILOT DET
FF 19 KHz 90°
FF 19 KHz 0°
IF BUF
TRIG
LED DRIVE
PD
STEREO SWITCH
ALC
REF DIVIDER
PHASE DETECT
Counter
Divider
Universal counter
SHIFT REGISTER LATCH
OPTION MATRIX
Charge pump
ES. 3104-217-03320. SERV. ES-UNIT


FM-IF
AM-IF
FM-DETECTOR
7103 LA1851N
AM IF
FM IF
V REG
AM RF
AM MIX
FM LEVEL DET
AM DET
AGC
COMP
MUTE
FM DET
FF 38KHz
VCO
IF BUF
PILOT DET
FF 19 KHz 90°
FF 19 KHz 0°
TRIG
LED DRIVE
PD
STEREO SWITCH
AM OSC
ALC
DECODER
SEARCH LEVEL
CROSSTALK
ANTI BIRDY FILTER
FERROCEPTOR
AM-OSC
LOOPFILTER
7105 LC7218
REF DIVIDER
PHASE DETECT
Counter
Divider
Universal counter
SHIFT REGISTER LATCH
OPTION MATRIX
JST 1117
LEFT
GND
RIGHT
to / from 1401 on FRONT AF-Part
7-FOLD JST 1112
LOW = VALID SIGNAL
MUT = LOW
STEREO = LOW
STSIG
MUTE
STEREO
CE
DATA Out
DATA
CLOCK
to / from 1411 on FRONT Control-Part
0v = no communication
During communication micro processor in frontpanel
HIGH=COUNT ENABLE
MUTE AF-OUT
mute
off
2nd stop
1st stop
AM
FM
mono
stereo
Mono = low
AM = low
KILL=LOW
SW-HIGH
MW=LOW
LW
MW
7.2MHz
456kHz
10.7MHz
FM osc 98.2 118.7MHz
= FM
= AM
— = FM sign
...... = AM sign

OPTION DIODES	6121	6122	6123
EUROPE	-	-	-
USA	X	-	X
OVERSEAS	-	X	-
EAST EUROPE	X	X	X
JAPAN	-	X	X
EUROPE+SW	X	-	-
OVERSEAS+SW	X	X	-

X = DIODE MOUNTED

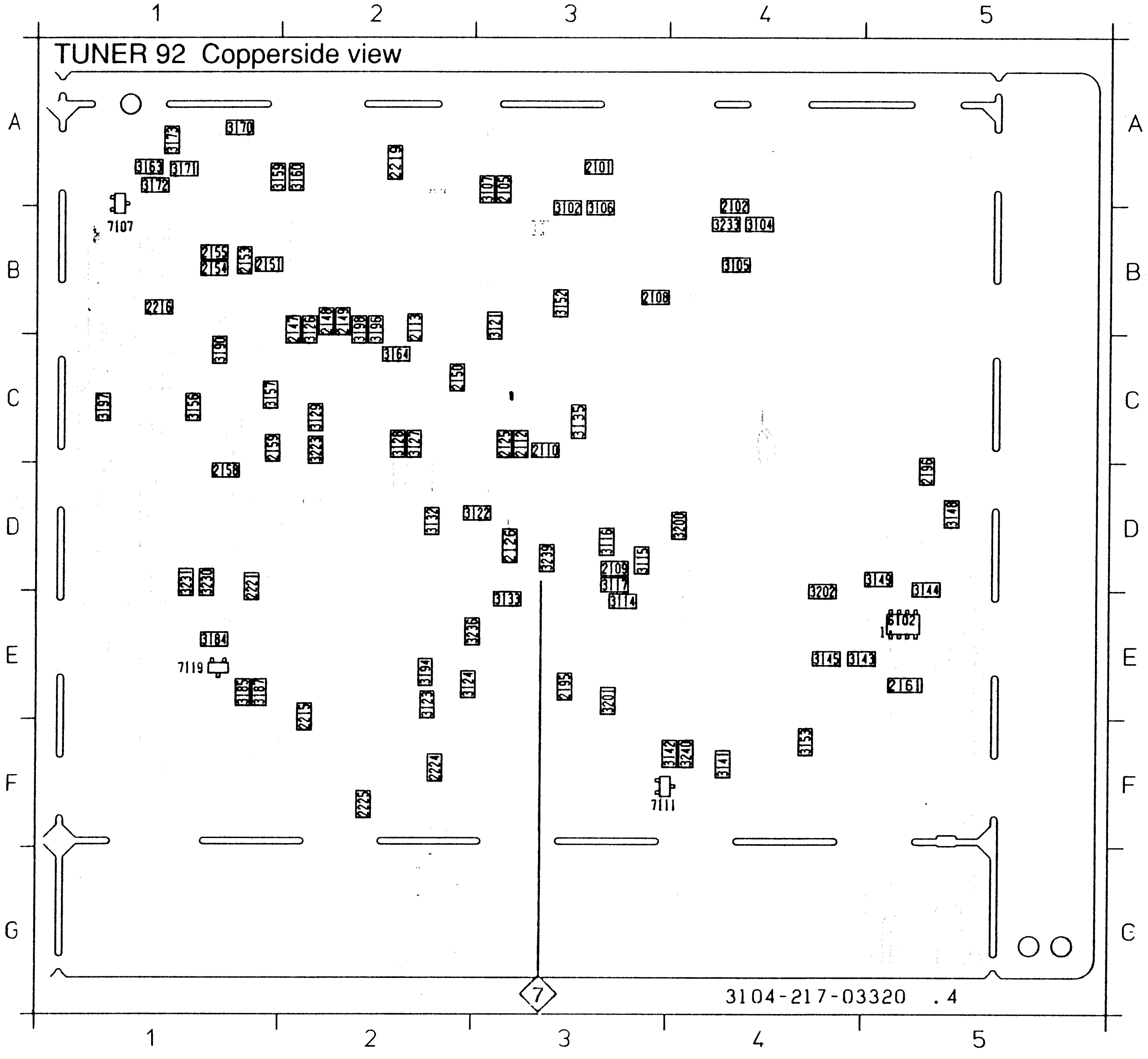
5101 E4

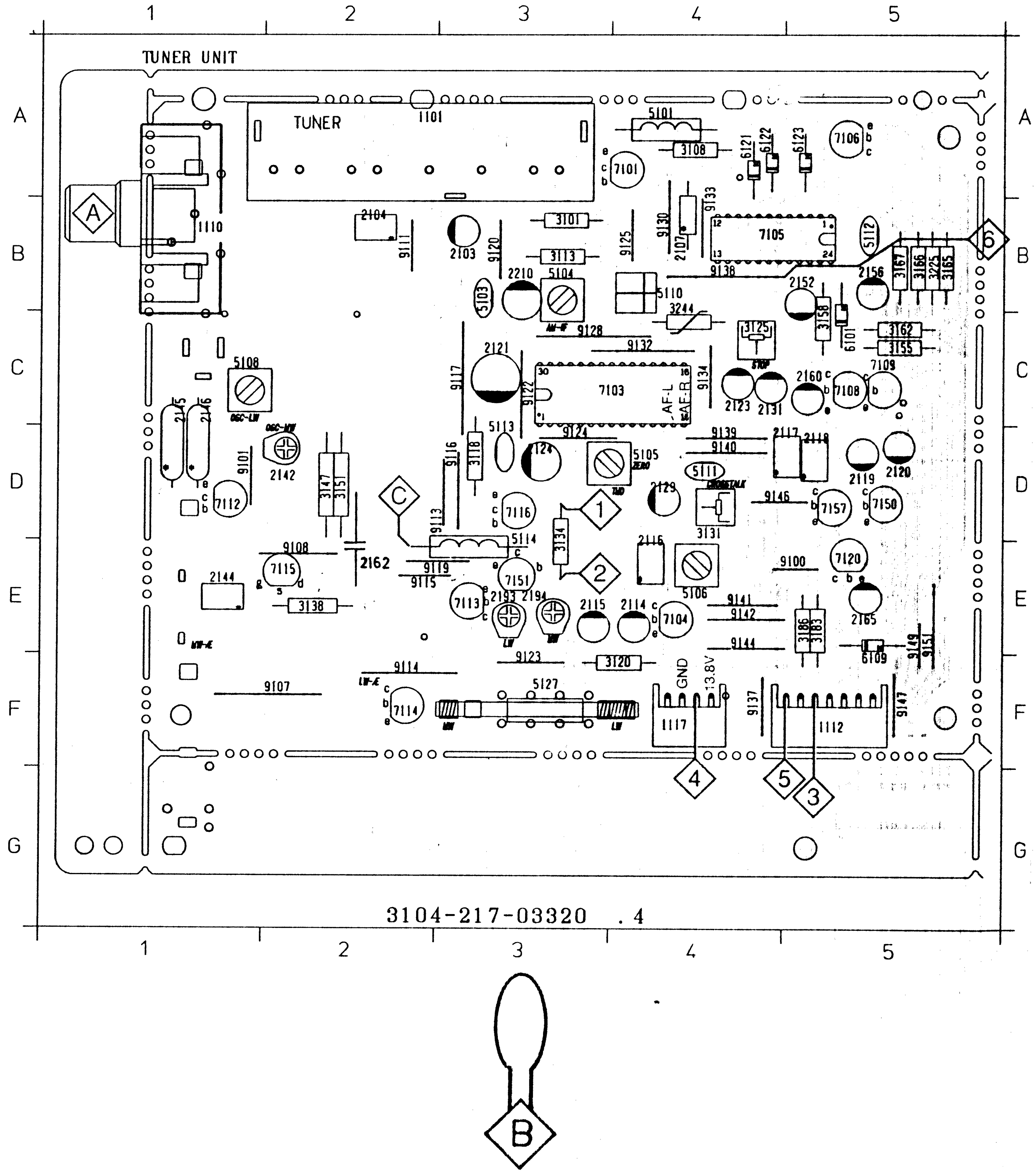
1101	D2	5104	B15
2101	C1	5105	B18
2102	C2	5106	H15
2103	C1	5111	D18
2104	E2	5111	G18
2105	F3	5112	M15
2107	F4	5127	K7
2108	B4	6101	L17
2109	C11	6102	K8
2110	D11	6109	G24
2112	B16	6121	O21
2113	B13	6122	O21
2114	B19	6123	O21
2115	B21	7101	F4
2116	B21	7103	E12
2117	E24	7104	B20
2118	F24	7105	M17
2119	D24	7106	L26
2120	F24	7107	M25
2121	E11	7108	P17
2123	G12	7109	P18
2124	G17	7111	O5
2125	G13	7112	N9
2126	G14	7113	O15
2129	G16	7114	N6
2131	G20	7115	J8
2141	K7	7116	C11
2142	N10	7119	G27
2144	L8	7120	G24
2145	K9	7150	E27
2146	M9	7151	N8
2147	K18	7157	E27
2148	K19	9116	D9
2149	K18	9117	D5
2150	L20		
2151	L15		
2152	L15		
2153	L20		
2154	M15		
2155	M15		
2156	O18		
2158	P17		
2159	P17		
2160	P18		
2161	I9		
2162	J10		
2165	G24		
2193	M7		
2194	M7		
2195	M8		
2196	M10		
2197	M10		
2210	B17		
2215	G22		
2216	K20		
2219	F4		
2221	G12		
2224	E28		
2225	E28		
3101	B1		
3102	C2		
3104	C2		
3105	E1		
3106	D2		
3107	F3		
3108	E4		
3113	A4		
3114	C10		
3115	D10		
3116	D11		
3117	C11		
3118	B11		
3120	A16		
3121	B14		
3122	B18		
3123	B20		
3124	B21		
3126	B24		
3127	E23		
3128	F23		
3129	G19		
3132	G16		
3133	G13		
3134	G17		
3135	F10		
3138	I9		
3141	N5		
3142	O6		
3143	K8		
3144	K8		
3145	I8		
3147	L8		
3148	K9		
3149	N9		
3150	O15		
3151	O16		
3152	O16		
3153	L6		
3155	O18		
3156	O18		
3157	P17		
3158	O17		
3159	O21		
3160	O21		
3162	K16		
3163	M25		
3164	K19		
3165	K21		
3166	K22		
3167	K20		
3170	M25		
3171	N25		
3172	M26		
3173	L26		
3183	H27		
3184	G26		
3185	H26		
3186	H23		
3187	G24		
3190	L16		
3194	B20		
3196	B22		
3197	L27		
3198	A20		
3200	D9		
3201	N8		
3202	G11		
3223	G12		
3225	K21		
3230	E27		
3231	E27		
3233	D1		
3236	G13		
3239	G16		
3240	N5		
3244	B22		

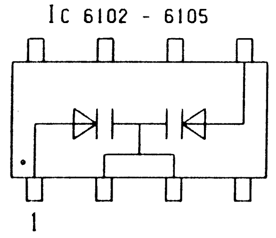
TUNER 92 LAYOUT (For /22 only)

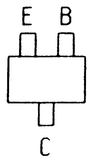
2101	A3	2125	C3	2154	B1	2216	B1			3117	D3	3129	C2	3145	E4	3160	A2	3185	E1	3201	E3	3240	F4
2102	B4	2126	D3	2155	B1	2219	A2	3104	B4	3121	B3	3132	D2	3148	D5	3163	A1	3187	E1	3202	E4	6102	E5
2105	A3	2147	B2	2158	D1	2221	D1	3105	B4	3122	D3	3133	E3	3149	D5	3164	C2	3190	C1	3223	C2	7107	B1
2108	B3	2148	B2	2159	C1			3106	B3	3123	E2	3135	C3	3152	B3	3170	A1	3194	E2	3230	D1	7111	F3
2109	D3	2149	B2	2161	E5			3107	A3	3124	E3	3141	F4	3153	F4	3171	A1	3196	B2	3231	D1	7119	E1
2110	C3	2150	C2	2195	E3	2224	F2	3114	E3	3126	B2	3142	F4	3156	C1	3172	A1	3197	C1	3233	B4	TUNER	A1
2112	C3	2151	B1	2196	D5	2225	F2	3115	D3	3127	C2	3143	E5	3157	C1	3173	A1	3198	B2	3236	E3		
2113	B2	2153	B1	2215	E2	3102	B3	3116	D3	3128	C2	3144	E5	3159	A2	3184	E1	3200	D4	3239	D3		

1101	A2	2119	D5	2156	B5	3131	D4	3186	E5	5113	D3	7106	A5	9100	E5	9122	C3	9140	D4		
1110	B1	2120	D5	2160	C5	3134	D3	3225	B5	5114	E3	7108	C5	9101	D1	9123	F3	9141	E4		
1112	F5	2121	C3	2165	E5	3138	E2	3244	C4	5127	F3	7109	C5	9107	F2	9124	D3	9142	E4		
1117	F4	2123	C4	2193	E3	3147	D2	5101	A4	6101	C5	7112	D1	9108	E2	9125	B4	9144	E4		
2103	B3	2124	D3	2194	E3	3151	D2	5103	B3	6109	F5	7113	E3	9111	B2	9128	C3	9146	D4		
2104	B2	2129	D4	2210	B3	3155	C5	5104	B3	6121	A4	7114	F2	9113	D3	9130	B4	9147	F5		
2107	B4	2131	C4	3101	B3	3158	C5	5105	D4	6122	A4	7115	E2	9114	F2	9132	C4	9149	E5		
2114	E4	2142	D2	3108	A4	3162	C5	5106	E4	6123	A5	7116	D3	9115	E2	9133	B4	9151	E5		
2115	E3	2144	E1	3113	B3	3165	B5	5108	C1	7101	A4	7120	E5	9116	D3	9134	C4				
2116	E4	2145	C1	3118	D3	3166	B5	5110	B4	7103	C4	7150	D5	9117	C3	9137	F4				
2117	D5	2146	C1	3120	F4	3167	B5	5111	D4	7104	E4	7151	E3	9119	E3	9138	B4				
2118	D5	2152	B5	3125	C4	3183	E5	5112	B5	7105	B4	7157	D5	9120	B3	9139	D4	2162	E2		


1
2
3
4
5
TUNER 92 Copperside view
A
B
C
D
E
F
G
7107
7119
7111
6102
7
3104-217-03320 .4


1
2
3
4
5
TUNER UNIT
TUNER
1101
A
B
C
D
E
F
G
1110
1117
1112
7105
7103
GND
13.8V
1
2
3
4
5
6
3104-217-03320 .4
B


Ic 6102 - 6105
1



TUNE

Wa

VARIC.

FM

87.5

AM

2-band ver

530

LW

153

MW

522

FM IF

FM

STERE

FM

SEARC

FM

AM - IF

MW

AM RF

AM

2-band ver

m=30%

LW

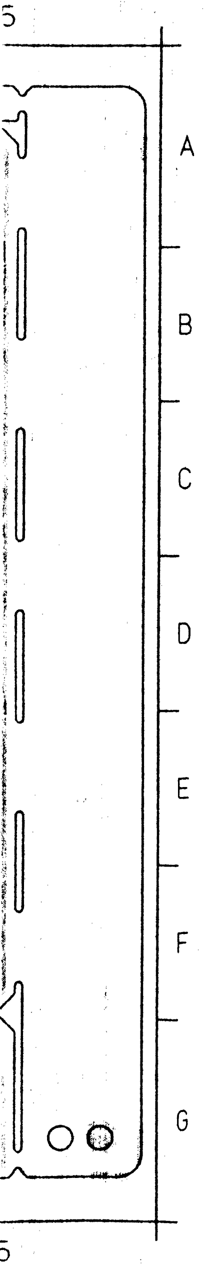
m=30%

MW

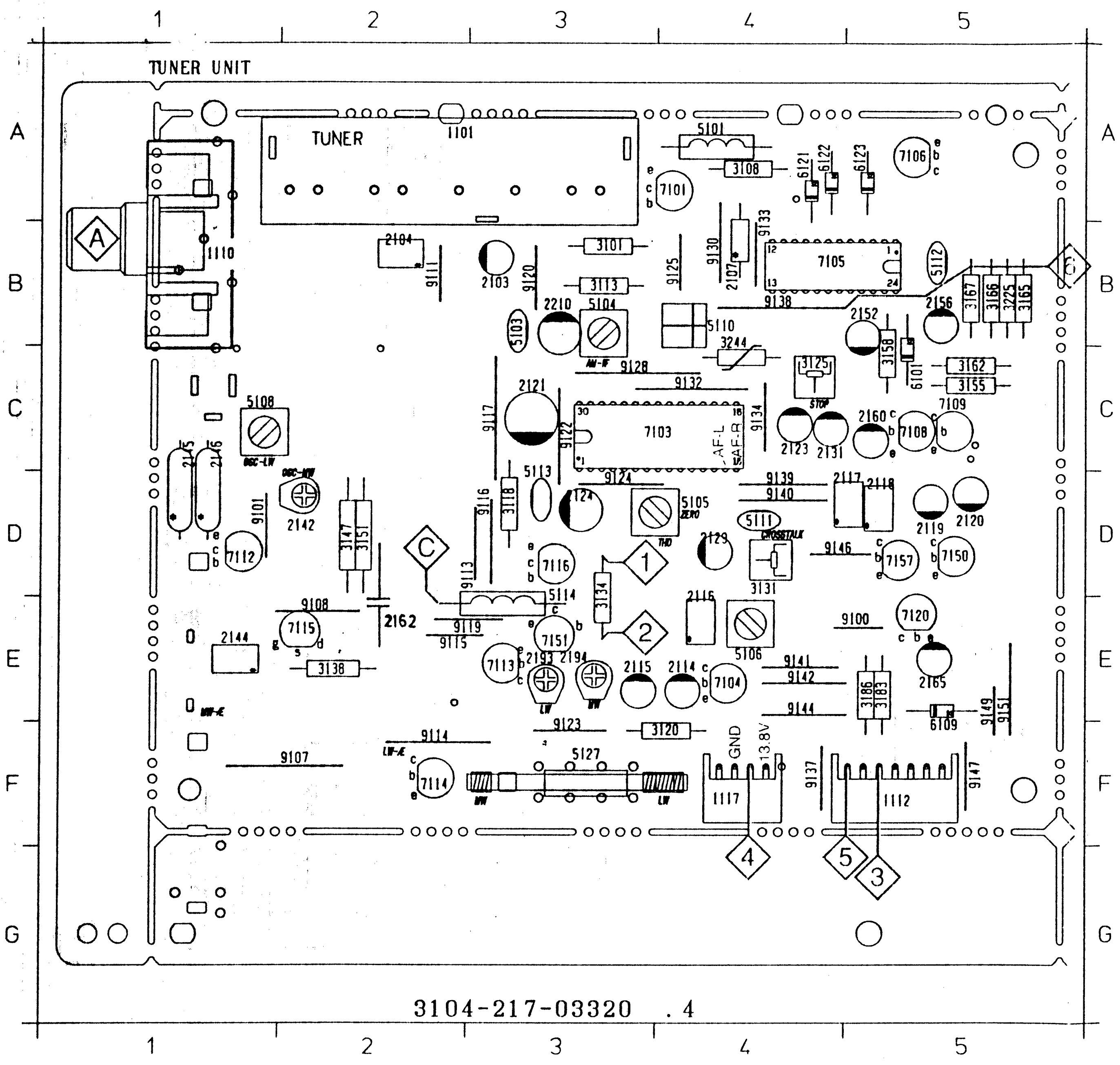
m=30%

repeat

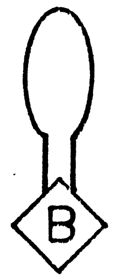
E3	3240	F4
E4	6102	E5
C2	7107	B1
D1	7111	F3
D1	7119	E1
B4	TUNER	A1
E3		
D3		



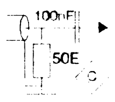
1101	A2	2119	D5	2156	B5	3131	D4	3186	E5	5113	D3	7106	A5	9100	E5	9122	C3	9140	D4
1110	B1	2120	D5	2160	C5	3134	D3	3225	B5	5114	E3	7108	C5	9101	D1	9123	F3	9141	E4
1112	F5	2121	C3	2165	E5	3138	E2	3244	C4	5127	F3	7109	C5	9107	F2	9124	D3	9142	E4
1117	F4	2123	C4	2193	E3	3147	D2	5101	A4	6101	C5	7112	D1	9108	E2	9125	B4	9144	E4
2103	B3	2124	D3	2194	E3	3151	D2	5103	B3	6109	F5	7113	E3	9111	B2	9128	C3	9146	D4
2104	B2	2129	D4	2210	B3	3155	C5	5104	B3	6121	A4	7114	F2	9113	D3	9130	B4	9147	F5
2107	B4	2131	C4	3101	B3	3158	C5	5105	D4	6122	A4	7115	E2	9114	F2	9132	C4	9149	E5
2114	E4	2142	D2	3108	A4	3162	C5	5106	E4	6123	A5	7116	D3	9115	E2	9133	B4	9151	E5
2115	E3	2144	E1	3113	B3	3165	B5	5108	C1	7101	A4	7120	E5	9116	D3	9134	C4		
2116	E4	2145	C1	3118	D3	3166	B5	5110	B4	7103	C4	7150	D5	9117	C3	9137	F4		
2117	D5	2146	C1	3120	F4	3167	B5	5111	D4	7104	E4	7151	E3	9119	E3	9138	B4	2162	E2
2118	D5	2152	B5	3125	C4	3183	E5	5112	B5	7105	B4	7157	D5	9120	B3	9139	D4		



1
2
3
4
5
TUNER UNIT
A
B
C
D
E
F
G
TUNER
1101
1110
5101
3108
7101
6121
6122
6123
7106
2104
9111
3101
2103
9120
9125
9130
2107
9133
7105
5112
3113
2210
5104
9138
2156
3167
3166
3225
3165
5103
5110
3244
2152
3158
6101
3125
3162
3155
5108
9128
9132
2121
9117
7103
9122
9134
AF-L
AF-R
7109
2160
7108
2123
2131
2145
2146
9101
2142
5113
9116
3118
2124
5105
5111
9139
9140
2117
2118
2119
2120
3147
3151
7112
9113
7116
1
3131
9146
7157
7150
C
9108
5114
3134
2116
2162
9119
9115
2
7115
2144
3138
7113
2193
2194
7151
2115
2114
7104
5106
9100
7120
9141
9142
2165
3186
3183
9144
6109
9149
9151
9114
9107
9123
3120
5127
GND
13.8V
9137
9147
1117
1112
7114
4
5
3
3104-217-03320 .4

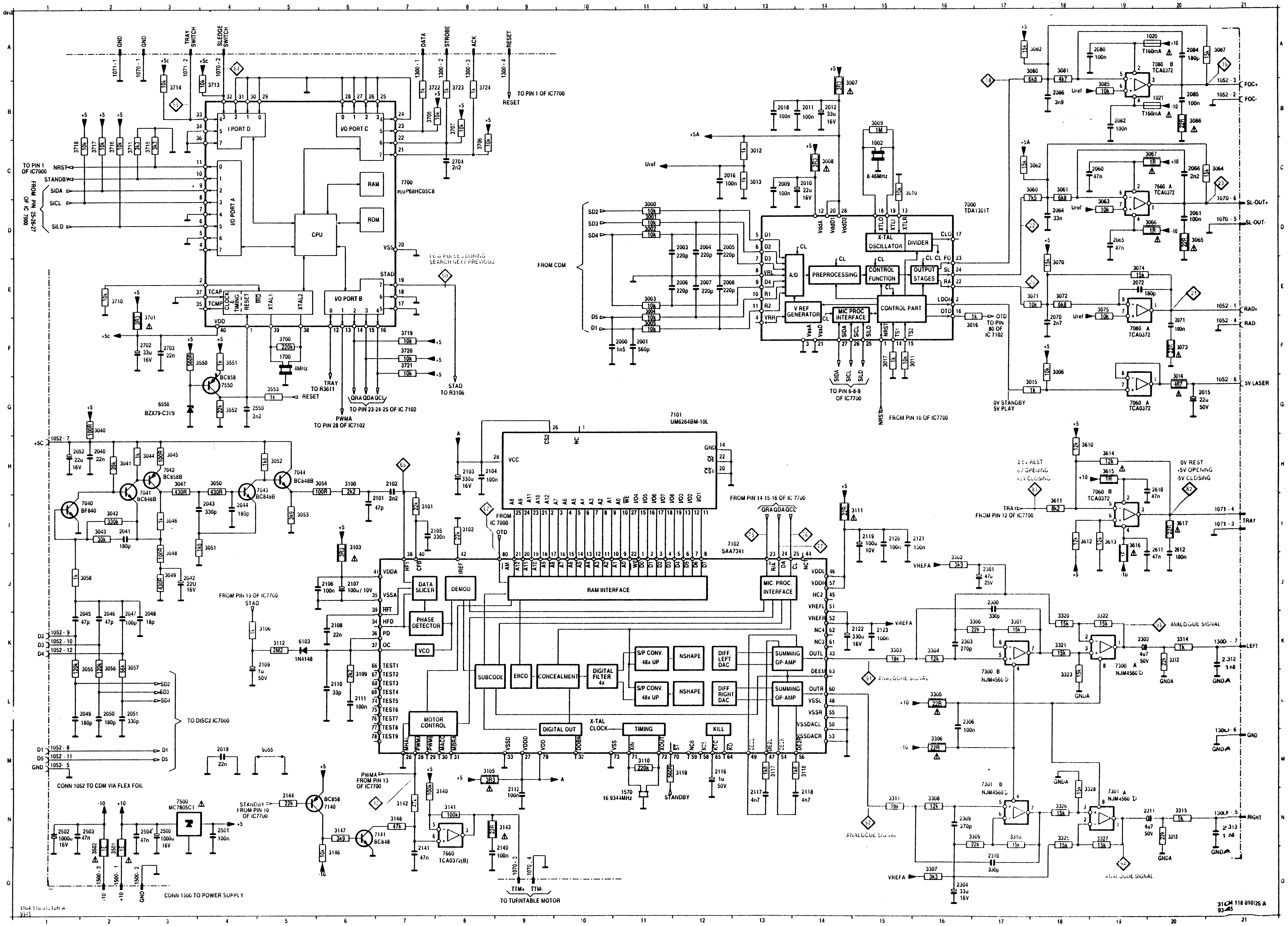


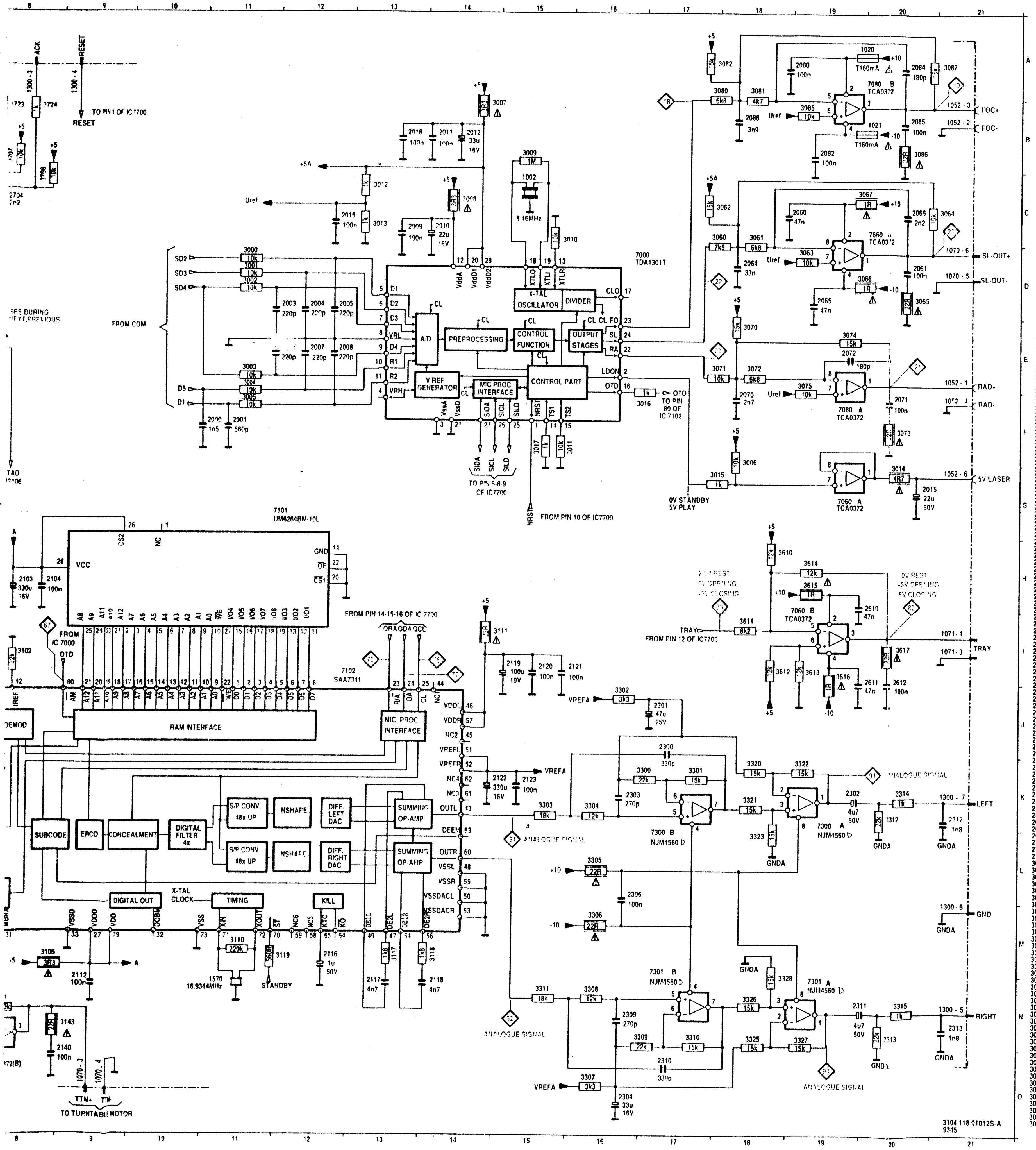
TUNER 92 Adjustment table (FM, MW - and FM, MW, LW - versions with AM ferrite antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM			108 MHz	check	6	7....9V
87.5 - 108MHz			87.5MHz	check		1.3....2V
AM 2-band version, 10kHz grid			1710kHz	5108		8.5V ± 0.1V
530 - 1710kHz			530kHz	check		1V ± 0.3V
LW			279kHz	5108		8.5V ± 0.1V
153 - 279kHz			153kHz	check		1V ± 0.1V
MW			1611kHz	2142		8.5V ± 0.1V
522 - 1611kHz			522kHz	check		1.1V ± 0.3V
FM IF						
FM	98 MHz, 1mV mod = 1kHz Δf = 75kHz	A	98MHz	5105	1 2	0V ± 20mV
STEREO CROSSTALK						
FM	98 MHz, 1mV 90% Left +9% pilot	A	98MHz	check	3	low < 1V
				3131	4	Right channel minimum
SEARCH SENSITIVITY						
FM	98 MHz, 15µV mod = 1kHz Δf = 75kHz	A	98MHz	3125	5	Switches just from High to Low
AM - IF						
MW	1494kHz Δf = 10kHz as low as possible		1494kHz	5104	7	symmetrical and max height
AM RF						
AM 2-band version, 10kHz grid m=30%, 1kHz	560kHz	B	560kHz	5107	7	MAX. ↕
	1600kHz		1600kHz	2141		
LW	155kHz		155kHz	5127 LW		
m=30%, 1kHZ	270kHz		270kHz	2193		
MW	558kHz		558kHz	5127 MW		
m=30%, 1kHz	1494kHz		1494kHz	2194		

↕ repeat

CD CIRCUIT


7700
μP68HC05C8
I PORT D
I/O PORT C
I/O PORT A
I/O PORT B
CPU
RAM
ROM
TO PIN 1 OF IC7700
RESET
TO PIN 1 OF IC7000
NRST
STANDBY
SIDA
SICL
SILD
FROM PIN 25-26-27 OF IC 7000
GND
TRAY SWITCH
SLEDGE SWITCH
DATA
STROBE
ACK
LOW PULSES DURING SEARCH NEXT PREVIOUS
TRAY TO R3611
PWMA TO PIN 28 OF IC7102
QRA QDA QCL TO PIN 23-24-25 OF IC 7102
STAD TO R3106
4MHz
6550 BZX79-C3V9
BC858 7550
7000
TDA1301T
FROM CDM
A/D
PREPROCESSING
CONTROL FUNCTION
OUTPUT STAGES
X-TAL OSCILLATOR
DIVIDER
CONTROL PART
V REF GENERATOR
MIC PROC INTERFACE
8.46MHz
OTD TO PIN 80 OF IC 7102
SIDA SICL SILD TO PIN 6-8-9 OF IC7700
NRST FROM PIN 10 OF IC7700
7080 B TCA0372
7080 A TCA0372
7060 A TCA0372
7060 B TCA0372
FOC+
FOC-
SL-OUT+
SL-OUT-
RAD+
RAD-
5V LASER
0V STANDBY 5V PLAY
TRAY FROM PIN 12 OF IC7700
0V REST +5V OPENING -5V CLOSING
TRAY
7101
UM6264BM-10L
7102
SAA7341
FROM PIN 14-15-16 OF IC 7700
DATA SLICER
DEMOD
PHASE DETECTOR
VCO
RAM INTERFACE
MIC. PROC INTERFACE
SUBCODE
ERCO
CONCEALMENT
DIGITAL FILTER 4x
S/P CONV. 48x UP
NSHAPE
DIFF. LEFT DAC
DIFF. RIGHT DAC
SUMMING OP-AMP
MOTOR CONTROL
DIGITAL OUT
X-TAL CLOCK
TIMING
KILL
16.9344MHz
FROM PIN 19 OF IC7700 STAD
1N4148
BF840 7040
BC848B 7041
BC858B 7042
BC848B 7043
BC848B 7044
TO DISC2 IC7000
CONN 1052 TO CDM VIA FLEX FOIL
7500 MC7805C1
CONN 1500 TO POWER SUPPLY
STANDBY FROM PIN 10 OF IC7700
BC858 7140
BC848 7141
PWMA FROM PIN 13 OF IC7700
7660 TCA0372(B)
TTM+ TTM-
TO TURNTABLE MOTOR
7300 B NJM4560 D
7300 A NJM4560 D
7301 B NJM4560 D
7301 A NJM4560 D
ANALOGUE SIGNAL
LEFT
RIGHT
GND
GNDA
VREFA
3104 118 0101 2R A 93-45
3104 118 01012S A 93-45


ACK
RESET
TO PIN 1 OF IC7700
FROM CDM
SD2
SD3
SD4
D5
D1
+5A
Uref
1002
8.46MHz
7000
TDA1301T
A/D
PREPROCESSING
X-TAL OSCILLATOR
DIVIDER
CONTROL FUNCTION
OUTPUT STAGES
V REF GENERATOR
MIC PROC INTERFACE
CONTROL PART
TO PIN 80 OF IC 7102
TO PIN 6-8-9 OF IC7700
FROM PIN 10 OF IC7700
OV STANDBY
5V PLAY
7080 B TCA0372
7660 A TCA0372
7080 A TCA0372
7060 A TCA0372
7060 B TCA0372
FOC+
FOC-
SL-OUT+
SL-OUT-
RAD+
RAD-
5V LASER
TRAY
FROM PIN 12 OF IC7700
0V REST +5V OPENING 5V CLOSING
7101
UM6264BM-10L
VCC
FROM IC 7000
OTD
FROM PIN 14-15-16 OF IC 7700
7102
SAA7341
RAM INTERFACE
MIC. PROC. INTERFACE
SUBCODE
ERCO
CONCEALMENT
DIGITAL FILTER 4x
S/P CONV. 48x UP
NSHAPE
DIFF. LEFT DAC
DIFF. RIGHT DAC
SUMMING OP-AMP
DIGITAL OUT
X-TAL CLOCK
TIMING
KILL
1570
16.9344MHz
STANDBY
7300 B NJM4560 D
7300 A NJM4560 D
7301 B NJM4560 D
7301 A NJM4560 D
ANALOGUE SIGNAL
LEFT
RIGHT
GND
GNDA
VREFA
TTM+
TTM-
TO TURNTABLE MOTOR
DEMOD
3104 118 01012S-A
9345

1002	C15
1020	A20
1021	B20
1052	K 1
1052	K 1
1052	M 1
1052	M 1
1052	K 1
1052	M 1
1052	H 1
1052	B21
1052	G21
1052	F21
1052	E21
1052	B21
1070	O 9
1070	O 9
1070	A 4
1070	A 2
1070	D21
1070	D21
1071	A 3
1071	A 2
1071	I21
1071	I21
1300	A 9
1300	A 8
1300	A 8
1300	A 7
1300	K21
1300	N21
1300	M21
1500	O 2
1500	O 2
1500	O 2
1570	N11
1700	F 5
2000	F11
2001	F11
2003	D12
2004	D12
2005	D12
2006	E12
2007	E12
2008	E12
2009	C13
2010	C14
2011	B14
2012	B14
2015	G20
2016	C12
2018	B13
2019	M 4
2040	H 2
2041	I 2
2042	J 3
2043	I 4
2044	I 4
2045	K 1
2046	K 2
2047	K 2
2048	K 3
2049	L 1
2050	L 2
2051	L 2
2052	H 1
2060	C18
2061	D20
2064	D18
2065	D19
2066	C20
2070	F18
2071	F20
2072	E19
2080	A19
2082	B19
2084	A20
2085	B20
2086	B18
2101	I 6
2102	H 7
2103	H 8
2104	H 8
2105	I 7
2106	J 6
2107	J 6
2108	K 6
2109	K 5
2110	L 6
2111	L 6
2112	N 9
2116	M12
2117	N13
2118	N14
2119	I15
2120	I15
2121	I15
2122	K14
2123	K15
2140	O 9
2141	O 7
2300	J17
2301	J17
2302	K19
2303	K16
2304	O16
2306	L16
2309	N16
2310	O17
2311	N19
2312	K21
2313	N21
2500	N 3
2501	N 4
2502	N 1
2503	N 2
2504	N 3
2550	G 4
2610	H20
2611	I20
2612	I20
2702	F 2
2703	F 3
2704	C 8
3000	D11
3001	D11
3002	D11
3003	E11
3004	E11
3005	F11
3006	F18
3007	B14
3008	C14
3009	B15
3010	C15
3011	F16
3012	C13
3013	C13
3014	G20
3015	G18
3016	F16
3017	F15
3040	G 2
3041	H 2
3042	I 2
3043	I 2
3044	H 3
3045	H 3
3046	I 3
3047	H 3
3048	J 3
3049	J 3
3050	H 4
3051	I 4
3052	H 5
3053	I 5
3054	H 6
3055	L 2
3056	K 2
3057	K 2
3058	J 2
3060	C18
3061	C18
3062	C17
3063	D19
3064	C21
3065	D20
3066	D19
3067	C19
3070	E18
3071	E18
3072	E18
3073	F20
3074	E19
3075	E19
3080	A18
3081	A18
3082	A17
3085	B19
3086	B20
3087	A21
3100	H 6
3101	I 7
3102	I 8
3103	I 6
3105	M 8
3106	K 5
3103	L 6
3110	M11
3111	I14
3112	K 5
3117	M13
3118	M14
3119	M12
3140	N 8
3141	N 8
3142	N 7
3143	N 9
3144	N 5
3146	O 6
3147	N 6
3148	N 7
3300	K16
3301	K17
3302	J16
3303	K15
3304	K16
3305	L16
3306	M16
3307	O16
3308	N16
3309	N16
3310	N17
3311	N15
3312	K20
3313	N20
3314	K20
3315	N20
3320	K18
3321	K18
3322	K19
3323	L18
3325	N18
3326	N18
3327	N19
3328	M18
3501	O 2
3502	O 2
3550	F 3
3551	F 4
3552	G 4
3553	G 5
3610	H18
3611	I18
3612	I18
3613	I19
3614	H19
3615	H19
3616	I19
3617	I20
3700	F 5
3701	F 3
3706	C 8
3707	B 8
3708	B 7
3710	E 2
3711	C 2
3713	B 4
3714	B 3
3715	C 3
3716	C 2
3717	C 2
3718	C 1
3719	F 7
3720	F 7
3721	F 7
3722	B 7
3723	B 8
3724	B 8
6103	K 5
6550	G 4
7000	D16
7040	I 2
7041	I 2
7042	H 3
7043	H 4
7044	H 5
7060	I19
7060	G19
7080	F19
7080	A20
7101	G11
7102	I12
7140	N 6
7141	N 6
7300	L17
7300	K19
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7301	N19
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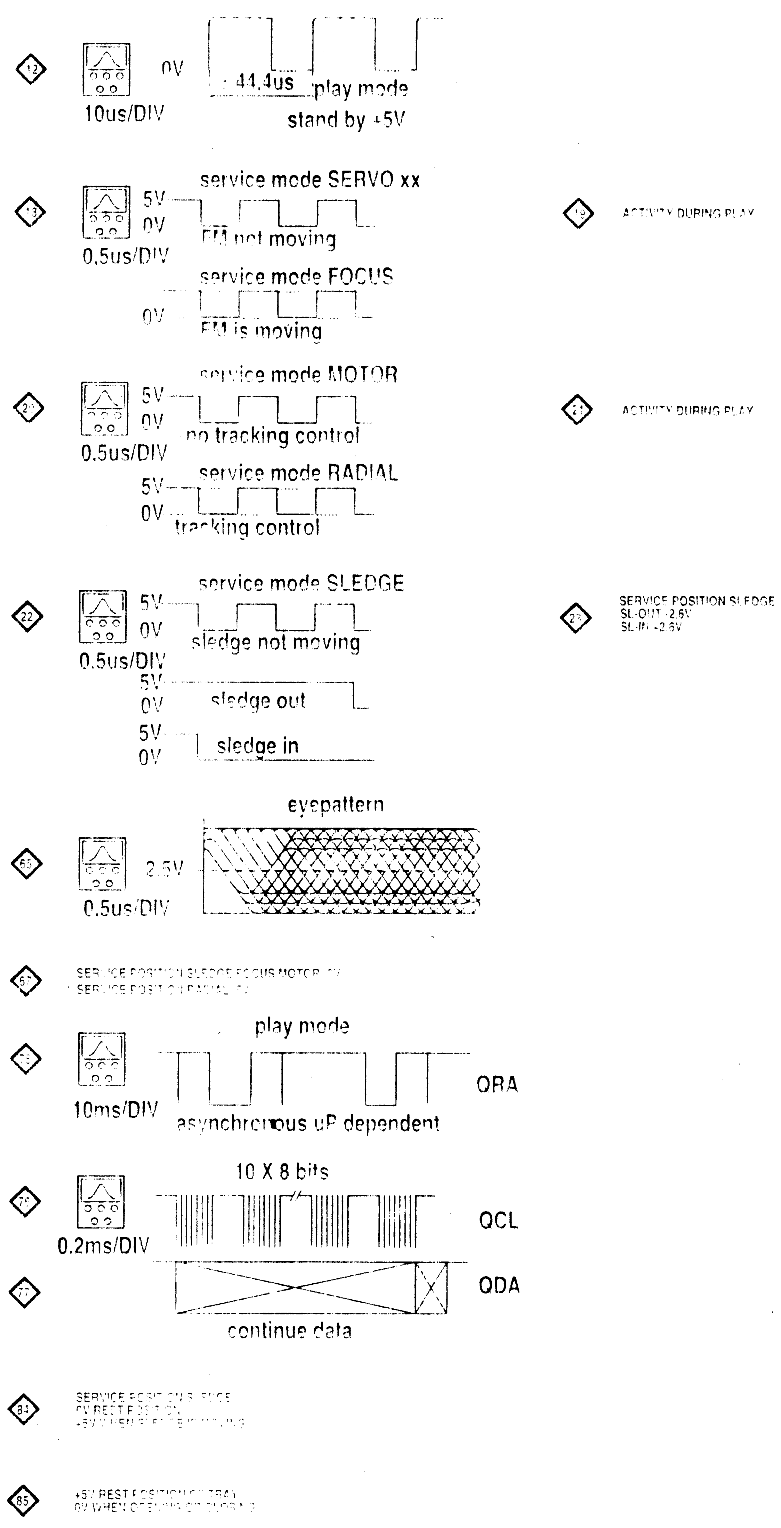
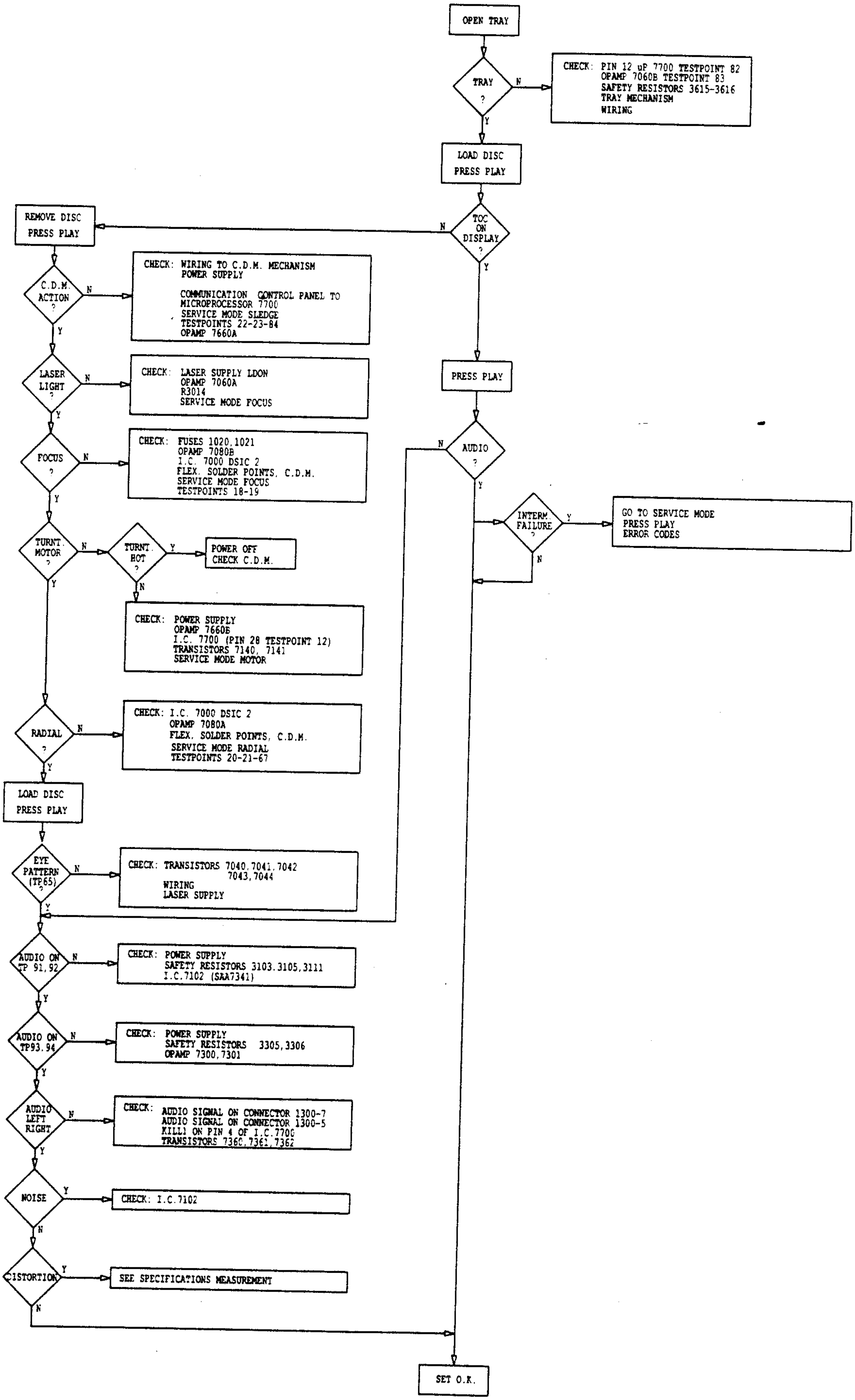
7660	O 8
7660	C20
7700	C 7
9055	M 5

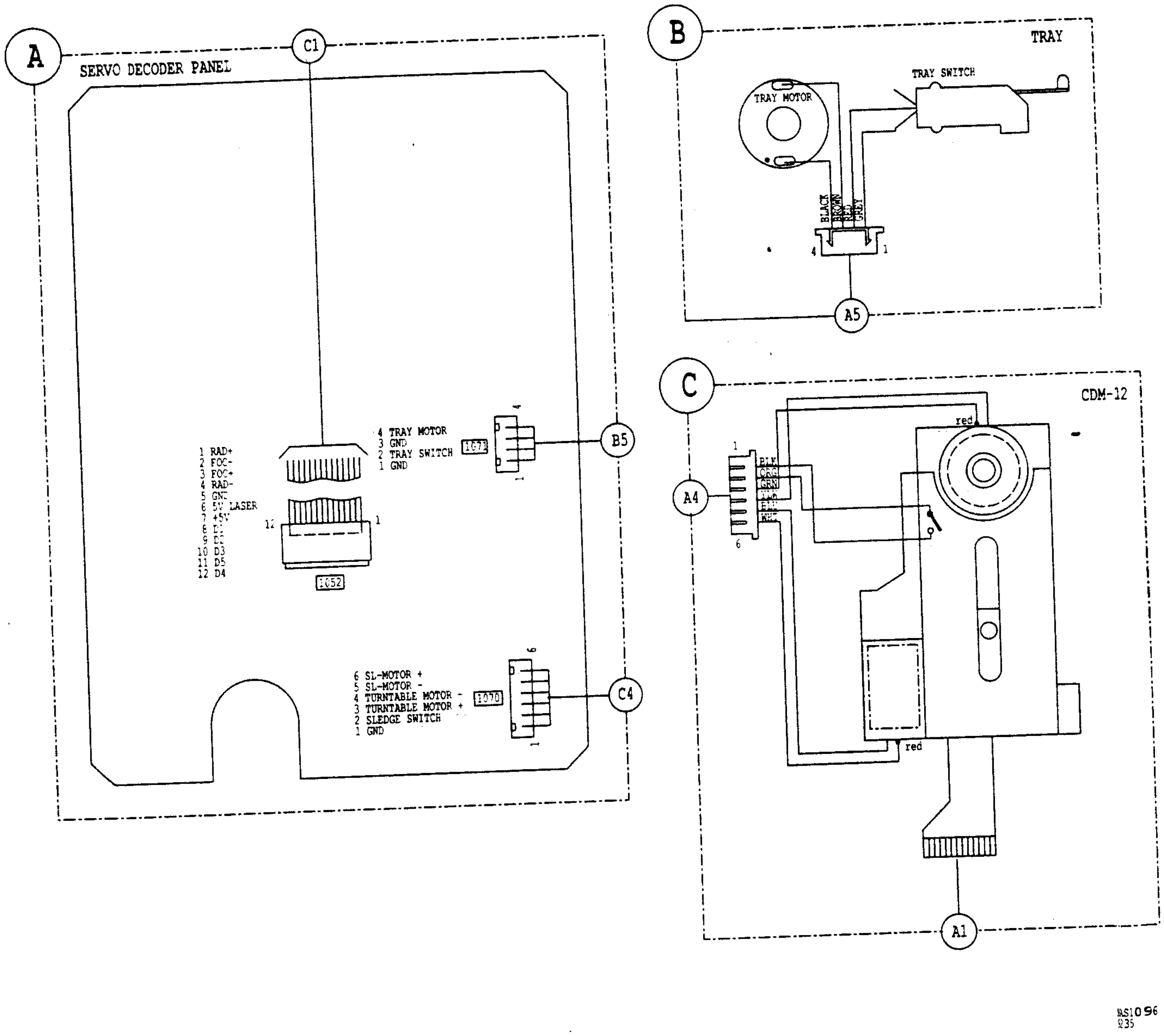

12
10us/DIV
0V
44.4us
play mode
stand by +5V
13
0.5us/DIV
5V
0V
service mode SERVO xx
FM not moving
service mode FOCUS
0V
FM is moving
20
0.5us/DIV
5V
0V
service mode MOTOR
no tracking control
service mode RADIAL
5V
0V
tracking control
22
0.5us/DIV
5V
0V
service mode SLEDGE
sledge not moving
5V
0V
sledge out
5V
0V
sledge in
65
0.5us/DIV
2.5V
eyepattern
19
ACTIVITY DURING PLAY
21
ACTIVITY DURING PLAY
23
SERVICE POSITION SLEDGE
SL-OUT -2.6V
SL-IN -2.6V
67
SERVICE POSITION SLEDGE FOCUS MOTOR
SERVICE POSITION RADIAL
73
10ms/DIV
play mode
QRA
asynchronous uP dependent
79
0.2ms/DIV
10 X 8 bits
QCL
77
QDA
continue data
84
SERVICE POSITION SLEDGE
0V REST POSITION
85
+5V REST POSITION TRAY
0V WHEN OPENING OR CLOSING

CD REPAIR CHART


OPEN TRAY
TRAY ?
N
CHECK: PIN 12 uP 7700 TESTPOINT 82
OPAMP 7060B TESTPOINT 83
SAFETY RESISTORS 3615-3616
TRAY MECHANISM
WIRING
Y
LOAD DISC
PRESS PLAY
TOC ON DISPLAY ?
N
REMOVE DISC
PRESS PLAY
C.D.M. ACTION ?
N
CHECK: WIRING TO C.D.M. MECHANISM
POWER SUPPLY
COMMUNICATION CONTROL PANEL TO
MICROPROCESSOR 7700
SERVICE MODE SLEDGE
TESTPOINTS 22-23-84
OPAMP 7660A
Y
LASER LIGHT ?
N
CHECK: LASER SUPPLY LDON
OPAMP 7060A
R3014
SERVICE MODE FOCUS
Y
FOCUS ?
N
CHECK: FUSES 1020,1021
OPAMP 7080B
I.C. 7000 DSIC 2
FLEX. SOLDER POINTS, C.D.M.
SERVICE MODE FOCUS
TESTPOINTS 18-19
Y
TURNT. MOTOR ?
N
TURNT. HOT ?
Y
POWER OFF
CHECK C.D.M.
N
CHECK: POWER SUPPLY
OPAMP 7660B
I.C. 7700 (PIN 28 TESTPOINT 12)
TRANSISTORS 7140, 7141
SERVICE MODE MOTOR
Y
RADIAL ?
N
CHECK: I.C. 7000 DSIC 2
OPAMP 7080A
FLEX. SOLDER POINTS, C.D.M.
SERVICE MODE RADIAL
TESTPOINTS 20-21-67
Y
LOAD DISC
PRESS PLAY
EYE PATTERN (TP65) ?
N
CHECK: TRANSISTORS 7040,7041,7042
7043,7044
WIRING
LASER SUPPLY
Y
AUDIO ON TP 91,92
N
CHECK: POWER SUPPLY
SAFETY RESISTORS 3103.3105,3111
I.C.7102 (SAA7341)
Y
AUDIO ON TP93.94
N
CHECK: POWER SUPPLY
SAFETY RESISTORS 3305,3306
OPAMP 7300,7301
Y
AUDIO LEFT RIGHT
N
CHECK: AUDIO SIGNAL ON CONNECTOR 1300-7
AUDIO SIGNAL ON CONNECTOR 1300-5
KILL1 ON PIN 4 OF I.C.7700
TRANSISTORS 7360,7361,7362
Y
NOISE
Y
CHECK: I.C.7102
N
DISTORTION
Y
SEE SPECIFICATIONS MEASUREMENT
N
Y
PRESS PLAY
AUDIO ?
N
Y
INTERM. FAILURE ?
Y
GO TO SERVICE MODE
PRESS PLAY
ERROR CODES
N
SET O.K.

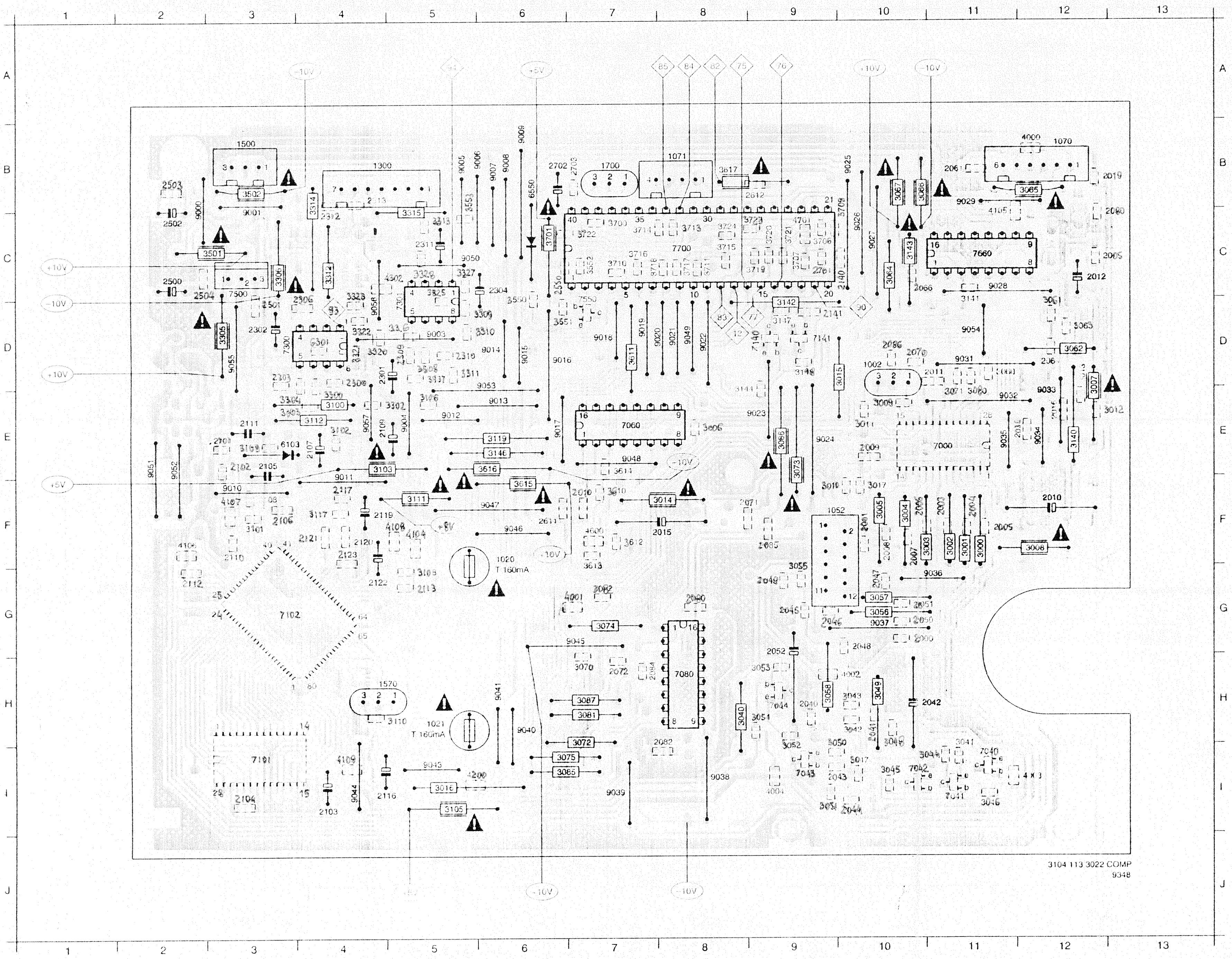
HAS1082
9218

CD WIRING


A
SERVO DECODER PANEL
C1
1 RAD+
2 FOC-
3 FOC+
4 RAD-
5 GND
6 5V LASER
7 +5V
8 D1
9 D2
10 D3
11 D5
12 D4
12
1
1052
4 TRAY MOTOR
3 GND
2 TRAY SWITCH
1 GND
1071
4
1
B5
6 SL-MOTOR +
5 SL-MOTOR -
4 TURNTABLE MOTOR -
3 TURNTABLE MOTOR +
2 SLEDGE SWITCH
1 GND
1070
6
1
C4
B
TRAY
TRAY MOTOR
TRAY SWITCH
BLACK
BROWN
RED
GREY
4
1
A5
C
CDM-12
red
1
BLK
ORG
GRN
WHT
6
A4
red
A1
BS1096
935

CD COMPONENT AND TRACK SIDE LAYOUT

1002	D10	2009	E10	2050	G10	2103	I4	2140	C10	2550	C6	3011	E10	3051	I9	3072	I7	3111	F5	3305	D3	3328	C5	3707	C9	4002	H10	7042	I10	9004	E5	9022	D8	9041	H6
1020	F6	2010	F12	2051	G10	2104	I3	2141	D9	2610	F7	3012	E12	3052	I9	3073	F9	3112	E4	3306	C3	3501	C2	3708	C10	4003	I12	7043	I9	9005	B5	9023	E8	9043	I5
1021	H5	2011	D10	2052	H9	2105	E3	2300	D4	2611	F6	3013	D12	3053	H9	3074	G7	3117	F4	3307	D5	3502	B3	3710	C7	4004	I9	7044	H9	9006	B6	9024	E9	9044	I4
1052	F9	2012	C12	2060	C12	2106	F3	2301	D4	2612	B8	3014	F7	3054	H9	3075	I6	3118	G5	3308	D5	3550	D6	3711	C8	4104	F5	7060	E7	9007	B6	9025	B10	9045	G6
1070	B12	2015	F7	2061	B11	2107	E4	2302	D3	2702	B6	3015	D10	3055	G9	3080	E11	3119	E6	3309	D5	3551	D6	3713	C8	4105	C11	7080	H8	9008	B6	9026	C10	9046	F6
1071	B8	2016	E12	2064	D12	2108	F3	2303	D3	2703	B7	3016	I5	3056	G10	3081	H7	3140	E12	3310	D5	3552	C7	3714	C7	4106	F2	7101	I3	9009	B6	9027	C10	9047	F6
1300	B4	2018	E12	2065	C12	2109	E4	2304	C6	2704	C9	3017	F10	3057	G10	3082	G7	3141	D11	3311	D5	3553	C5	3715	C8	4107	F3	7102	G3	9010	F3	9028	C11	9048	E7
1500	B3	2019	B12	2066	C10	2110	F3	2306	D3	3000	F11	3040	H8	3058	H9	3085	I6	3142	D9	3312	C4	3610	F7	3716	C7	4108	F4	7140	D9	9011	F4	9029	B11	9049	D8
1570	H4	2040	H9	2070	D10	2111	E3	2309	D5	3001	F11	3041	I11	3060	D11	3086	E9	3143	C10	3313	C5	3611	D7	3717	C8	4109	I4	7141	D9	9012	E5	9031	D11	9050	C5
1700	B7	2041	H10	2071	F8	2112	G2	2310	D5	3002	F11	3042	H10	3061	D12	3087	H7	3144	E8	3314	C4	3612	F7	3718	C7	4200	I5	7300	D3	9013	E6	9032	E11	9051	E2
2000	G10	2042	H10	2072	H7	2116	I4	2311	C5	3003	F11	3043	H10	3062	D12	3100	E4	3146	E6	3315	C5	3613	G7	3719	C8	4302	C4	7301	D5	9014	D6	9033	E12	9052	F2
2001	F10	2043	I9	2080	G8	2117	F4	2312	C4	3004	F10	3044	I10	3063	D12	3101	F3	3147	D9	3320	D4	3614	E7	3720	C9	4600	F7	7500	C3	9015	D6	9034	E12	9053	D5
2003	F11	2044	I10	2082	I7	2118	G5	2313	B4	3005	F10	3045	I10	3064	C10	3102	E4	3148	D9	3321	D4	3615	F6	3721	C9	4701	C9	7550	D7	9016	D6	9035	E11	9054	D11
2004	F11	2045	G9	2084	H7	2119	F4	2500	C2	3006	E8	3046	I11	3065	B12	3103	E4	3300	E4	3322	D4	3616	E6	3722	C7	6103	E3	7660	C11	9017	E6	9036	G10	9055	D3
2005	F11	2046	G9	2085	F9	2120	F4	2501	D3	3007	E12	3047	I10	3066	B10	3105	I5	3301	D4	3323	C4	3617	B8	3723	C8	6550	B6	7700	C8	9018	D7	9037	G10	9056	D4
2006	F10	2047	G10	2086	D10	2121	F4	2502	C2	3008	F12	3048	I10	3067	B10	3106	E5	3302	E4	3325	C5	3700	C7	3724	C8	7000	E11	9000	C2	9019	D7	9038	I8	9057	E4
2007	G10	2048	G10	2101	E3	2122	G4	2503	B2	3009	E10	3049	H10	3070	H7	3109	E3	3303	E3	3326	D5	3701	C6	4000	B12	7040	I11	9001	C3	9020	D8	9039	I7		
2008	F10	2049	G9	2102	E3	2123	F4	2504	C2	3010	F9	3050	I9	3071	E11	3110	H5	3304	E3	3327	C5	3706	C9	4001	G6	7041	I11	9003	D5	9021	D8	9040	H6		



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1021	I9	2010	F3	2050	G4	2102	F12	2122	G10	2502	C12	3007	E2	3046	I3	3064	D4
1052	F5	2011	E4	2051	G4	2103	J11	2123	G10	2503	B12	3008	G3	3047	I5	3065	C3
1070	B2	2012	C2	2052	H6	2104	I11	2140	D5	2504	D12	3009	E4	3048	I4	3066	C4
1071	B7	2015	F7	2060	C2	2105	F11	2141	D5	2550	D8	3010	F5	3049	H5	3067	C4
1300	B10	2016	E3	2061	B4	2106	F11	2300	E10	2610	F8	3011	E5	3050	I5	3070	H8
1500	B11	2018	E3	2064	E3	2107	F11	2301	E10	2611	F8	3012	E2	3051	I5	3071	E4
1570	H10	2019	B2	2065	C2	2108	F11	2302	D11	2612	C6	3013	E2	3052	I5	3072	I8
1700	B7	2040	H5	2066	D4	2109	E10	2303	E11	2702	B8	3014	F7	3053	H6	3073	F5
2000	H4	2041	I5	2070	D4	2110	G12	2304	D9	2703	B8	3015	E5	3054	H6	3074	G7
2001	F5	2042	H4	2071	F6	2111	E11	2306	D11	2704	C5	3016	I9	3055	G5	3075	I8
2003	F4	2043	I5	2072	H7	2112	G12	2309	D10	3000	G3	3017	F4	3056	G4	3080	E3
2004	F4	2044	J5	2080	G6	2116	I10	2310	D9	3001	G4	3040	I6	3057	G4	3081	H8
2005	F3	2045	G5	2082	I7	2117	F10	2311	C9	3002	G4	3041	I3	3058	H5	3082	G8
2006	F4	2046	G5	2084	H7	2118	G9	2312	C11	3003	G4	3042	I5	3060	E3	3085	I8
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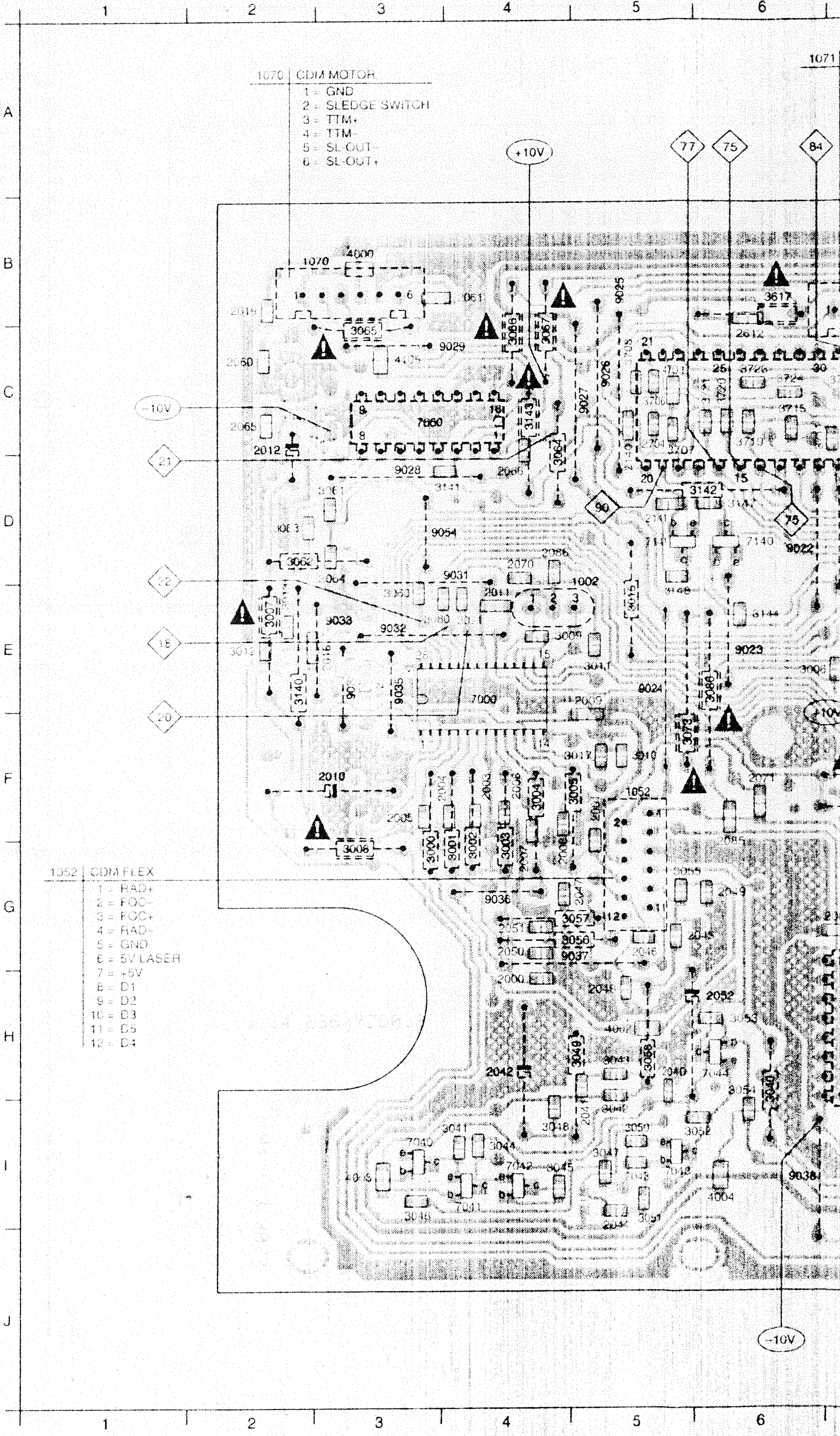

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C3	3501	C2	3708	C10	4003	I12	7043	I9	9005	B5	9023	E8	9043	I5
D5	3502	B3	3710	C7	4004	I9	7044	H9	9006	B6	9024	E9	9044	I4
D5	3550	D6	3711	C8	4104	F5	7060	E7	9007	B6	9025	B10	9045	G6
D5	3551	D6	3713	C8	4105	C11	7080	H8	9008	B6	9026	C10	9046	F6
D5	3552	C7	3714	C7	4106	F2	7101	I3	9009	B6	9027	C10	9047	F6
D5	3553	C5	3715	C8	4107	F3	7102	G3	9010	F3	9028	C11	9048	E7
C4	3610	F7	3716	C7	4108	F4	7140	D9	9011	F4	9029	B11	9049	D8
C5	3611	D7	3717	C8	4109	I4	7141	D9	9012	E5	9031	D11	9050	C5
C4	3612	F7	3718	C7	4200	I5	7300	D3	9013	E6	9032	E11	9051	E2
C5	3613	G7	3719	C8	4302	C4	7301	D5	9014	D6	9033	E12	9052	F2
D4	3614	E7	3720	C9	4600	F7	7500	C3	9015	D6	9034	E12	9053	D5
D4	3615	F6	3721	C9	4701	C9	7550	D7	9016	D6	9035	E11	9054	D11
D4	3616	E6	3722	C7	6103	E3	7660	C11	9017	E6	9036	G10	9055	D3
C4	3617	B8	3723	C8	6550	B6	7700	C8	9018	D7	9037	G10	9056	D4
C5	3700	C7	3724	C8	7000	E11	9000	C2	9019	D7	9038	I8	9057	E4
D5	3701	C6	4000	B12	7040	I11	9001	C3	9020	D8	9039	I7		
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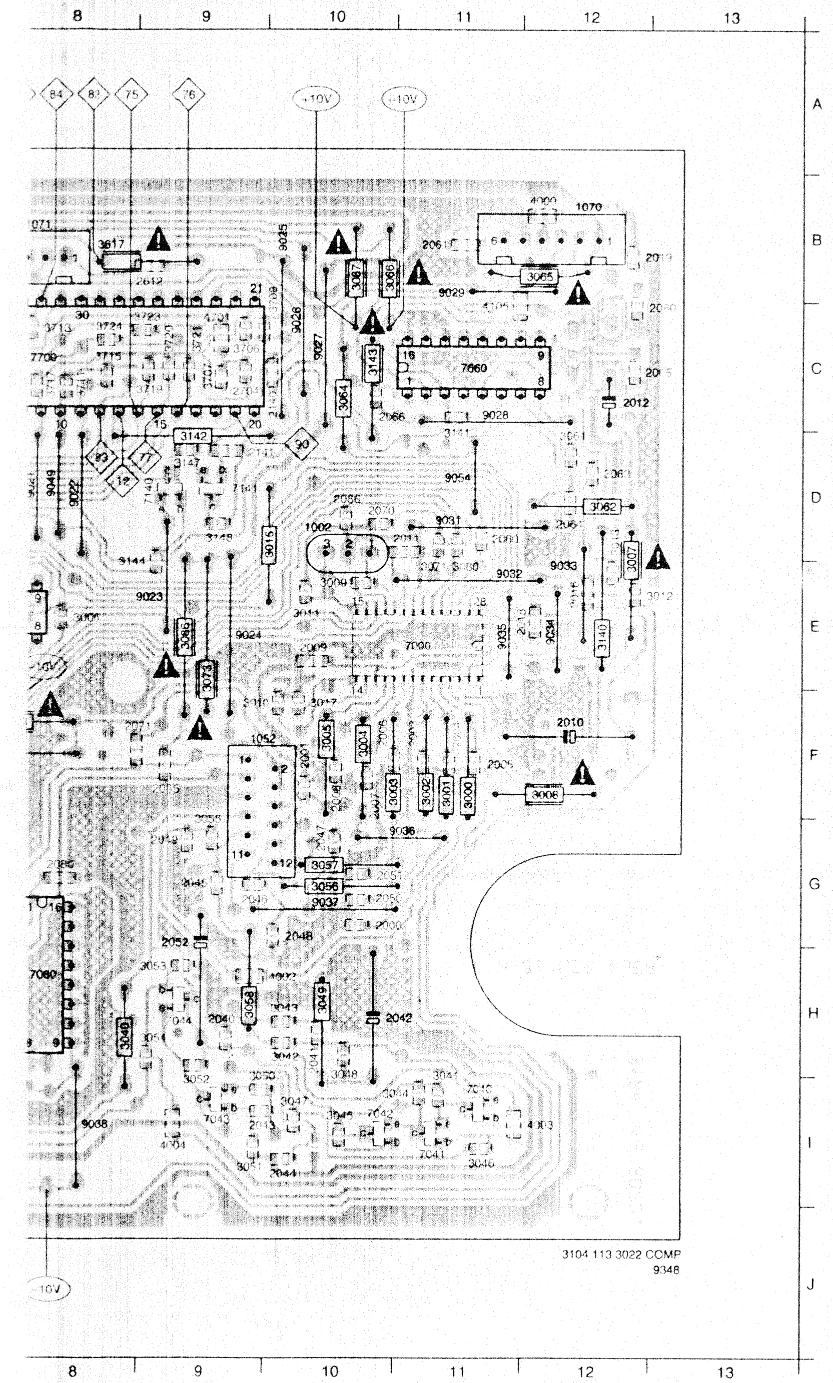

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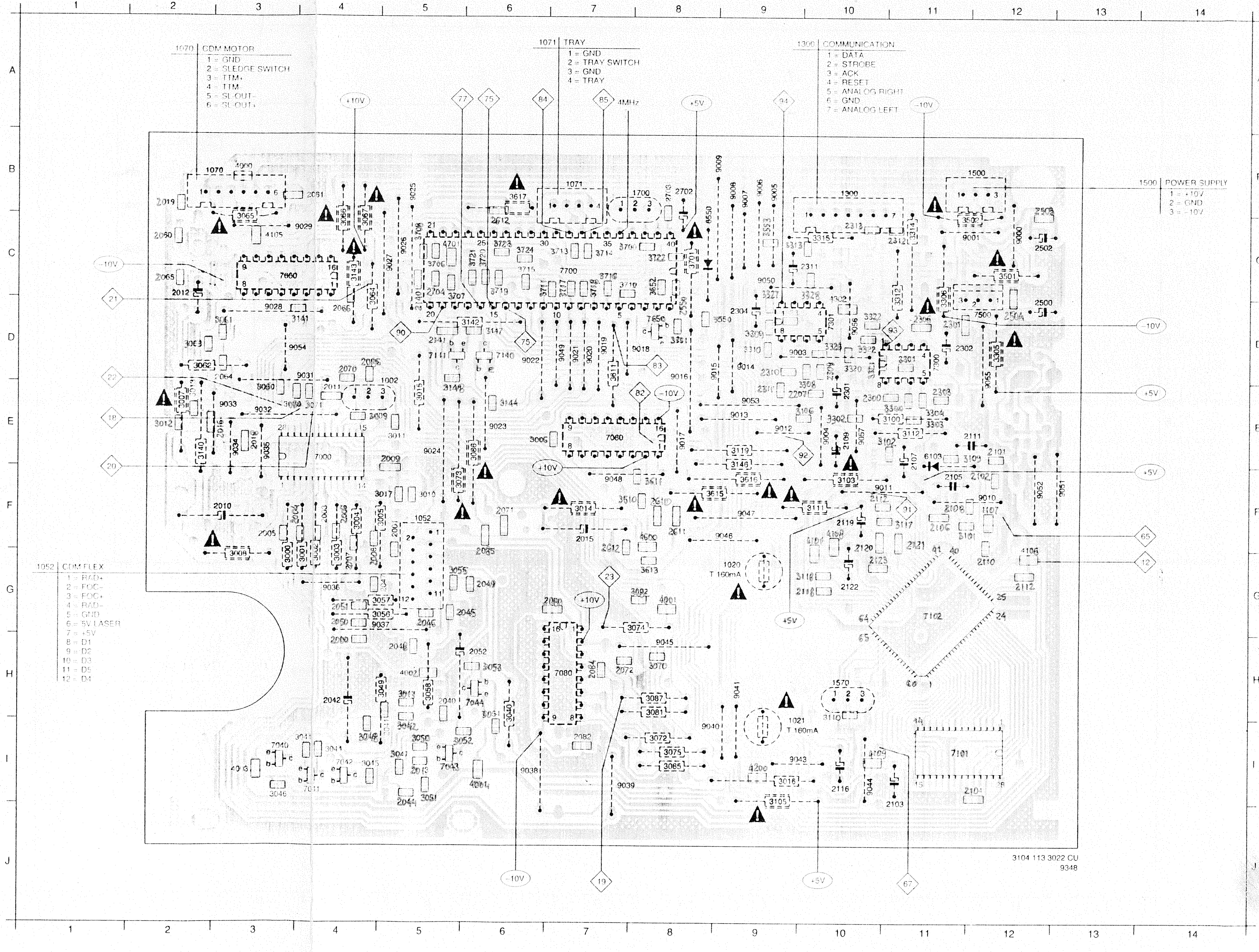
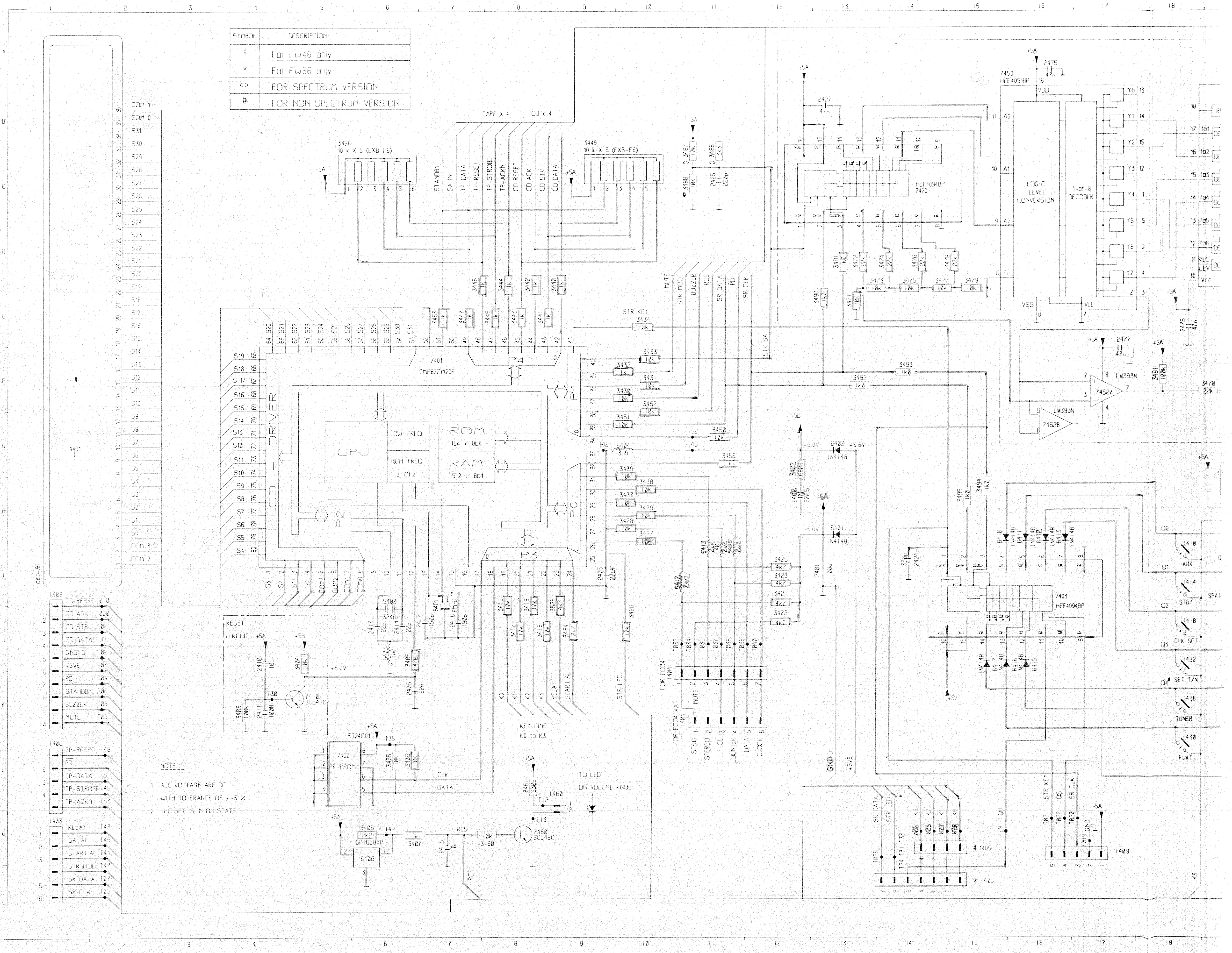
1020	G9	2009	E5	2049	G6	2101	E12	2121	F11	2501	D11	3006	E6	3045	I4	3063	D2	3100	E10	3144	E6	3313	C9	3610	F7	3715	C6	4106	G12	7080	H7	9007	B9	9024	E5	9043	I9
1021	I9	2010	F3	2050	G4	2102	F12	2122	G10	2502	C12	3007	E2	3046	I3	3064	D4	3101	F11	3146	F9	3314	C11	3611	D7	3716	C7	4107	F12	7101	I11	9008	B9	9025	B5	9044	I10
1052	F5	2011	E4	2051	G4	2103	J11	2123	G10	2503	B12	3008	G3	3047	I5	3065	C3	3102	E10	3147	D6	3315	C10	3612	G7	3717	D7	4108	F10	7102	G11	9009	B9	9026	C5	9045	H8
1070	B2	2012	C2	2052	H6	2104	I11	2140	D5	2504	D12	3009	E4	3048	I4	3066	C4	3103	F10	3148	E5	3320	D10	3613	G8	3718	D7	4109	I10	7140	D6	9010	F12	9027	C5	9046	F8
1071	B7	2015	F7	2060	C2	2105	F11	2141	D5	2550	D8	3010	F5	3049	H5	3067	C4	3105	I9	3300	E10	3321	D10	3614	F8	3719	C6	4200	I9	7141	D5	9011	F10	9028	D3	9047	F9
1300	B10	2016	E3	2061	B4	2106	F11	2300	E10	2610	F8	3011	E5	3050	I5	3070	H8	3106	E9	3301	D11	3322	D10	3615	F8	3720	C6	4302	D10	7300	D11	9012	E9	9029	C3	9048	F7
1500	B11	2018	E3	2064	E3	2107	F11	2301	E10	2611	F8	3012	E2	3051	I5	3071	E4	3109	E11	3302	E10	3323	D10	3616	F9	3721	C6	4600	F8	7301	D10	9013	E9	9031	D3	9049	D7
1570	H10	2019	B2	2065	C2	2108	F11	2302	D11	2612	C6	3013	E2	3052	I5	3072	I8	3110	I10	3303	E11	3325	D9	3617	B6	3722	C8	4701	C5	7500	D12	9014	D9	9032	E3	9050	C9
1700	B7	2040	H5	2066	D4	2109	E10	2303	E11	2702	B8	3014	F7	3053	H6	3073	F5	3111	F10	3304	E11	3326	D10	3700	C7	3723	C6	6103	E11	7550	D8	9015	D8	9033	E3	9051	F13
2000	H4	2041	I5	2070	D4	2110	G12	2304	D9	2703	B8	3015	E5	3054	H6	3074	G7	3112	E11	3305	D12	3327	C9	3701	C8	3724	C6	6550	C8	7660	C3	9016	D8	9034	E3	9052	F12
2001	F5	2042	H4	2071	F6	2111	E11	2306	D11	2704	C5	3016	I9	3055	G5	3075	I8	3117	F11	3306	D11	3328	C9	3706	C5	4000	B3	7000	E4	7700	C7	9017	E8	9035	E3	9053	E9
2003	F4	2043	I5	2072	H7	2112	G12	2309	D10	3000	G3	3017	F4	3056	G4	3080	E3	3118	G9	3307	E9	3501	C12	3707	D5	4001	G8	7040	I3	9000	C12	9018	D7	9036	G4	9054	D3
2004	F4	2044	J5	2080	G6	2116	I10	2310	D9	3001	G4	3040	I6	3057	G4	3081	H8	3119	E9	3308	E9	3502	C11	3708	C5	4002	H5	7041	I4	9001	C11	9019	D7	9037	G4	9055	E12
2005	F3	2045	G5	2082	I7	2117	F10	2311	C9	3002	G4	3041	I3	3058	H5	3082	G8	3140	E2	3309	D9	3550	D8	3710	C7	4003	I3	7042	I4	9003	D9	9020	D7	9038	I6	9056	D10
2006	F4	2046	G5	2084	H7	2118	G9	2312	C11	3003	G4	3042	I5	3060	E3	3085	I8	3141	D3	3310	D9	3551	D8	3711	C6	4004	I6	7043	I5	9004	E10	9021	D7	9039	I7	9057	E10
2007	G4	2047	G5	2085	G6	2119	F10	2313	C10	3004	F4	3043	H5	3061	D3	3086	E6	3142	D5	3311	E9	3552	C8	3713	C7	4104	F10	7044	H6	9005	B9	9022	D6	9040	I8		

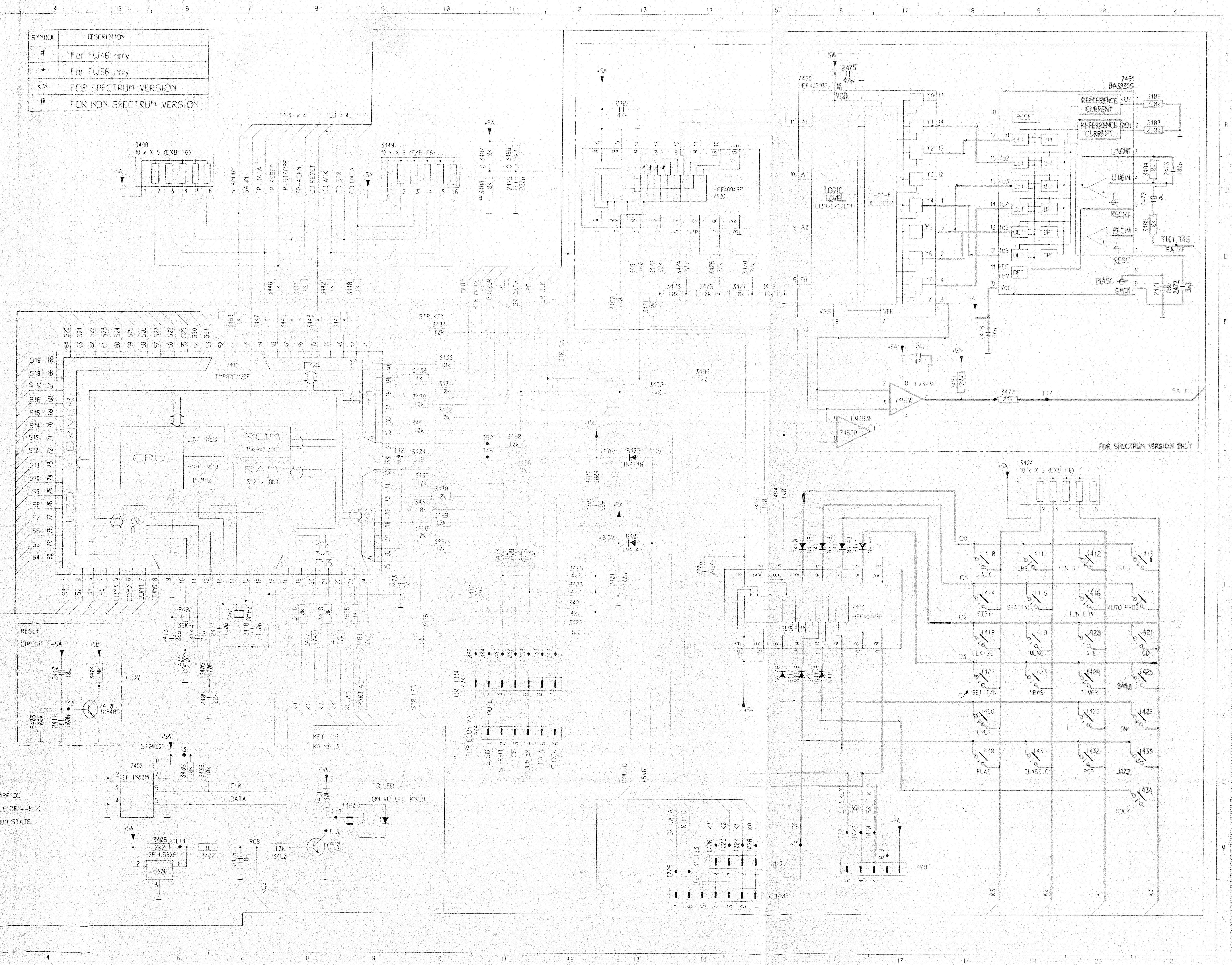


FRONT CIRCUIT



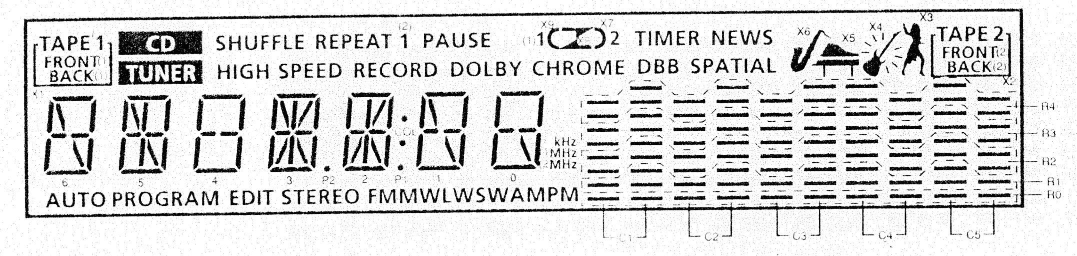
SYMBOL | DESCRIPTION
# For FW46 only
* For FW56 only
<> FOR SPECTRUM VERSION
@ FOR NON SPECTRUM VERSION
7401 TMP87CM20F
CPU
LOW FREQ
HIGH FREQ 8 MHz
ROM 16k x 8bit
RAM 512 x 8bit
LCD - DRIVER
P0
P1
P2
P4
1401
TAPE x 4
CD x 4
STANDBY
SA IN
TP-DATA
TP-RESET
TP-STROBE
TP-ACKN
CD RESET
CD ACK
CD STR
CD DATA
MUTE
STR MODE
BUZZER
RC5
SR DATA
PD
SR CLK
STR KEY
STR SA
RESET CIRCUIT
7410 BC548C
7402 EE-PROM
KEY LINE K0 to K3
RELAY
SPARTIAL
STR LED
TO LED ON VOLUME KNOB
7460 BC548C
6426 GP1U58XP
HEF4094BP 7420
7450 HEF4051BP
LOGIC LEVEL CONVERSION
1-of-8 DECODER
LM393N 7452A
7452B
7403 HEF4094BP
FOR ECCM VA 1404
STSEL
STEREO
CE
COUNTER
DATA
CLOCK
AUX
STBY
CLK SET
SET T/N
TUNER
FLAT
NOTE :
1 ALL VOLTAGE ARE DC WITH TOLERANCE OF +-5 %
2 THE SET IS IN ON STATE

SYMBOL	DESCRIPTION
#	For FW46 only
*	For FW56 only
<>	FOR SPECTRUM VERSION
@	FOR NON SPECTRUM VERSION



7401
TMP87CM20F
CPU
LOW FREQ
HIGH FREQ
8 MHz
ROM
16k × 8bit
RAM
512 × 8bit
P1
P2
P3
P4
P0
LCD DRIVER
3498
10 k X 5 (EXB-F6)
3449
10 k X 5 (EXB-F6)
3424
10 k X 5 (EXB-F6)
TAPE x 4
CD x 4
STANDBY
SA IN
TP-DATA
TP-RESET
TP-STROBE
TP-ACKN
CD RESET
CD ACK
CD STR
CD DATA
MUTE
STR MODE
BUZZER
RCS
SR DATA
PD
SR CLK
STR KEY
STR SA
STR LED
KEY LINE
K0 to K3
RELAY
SPATIAL
RESET CIRCUIT
7410
BC548C
ST24C01
7402
EE-PROM
CLK
DATA
TO LED
ON VOLUME KNOB
6406
GP1U58XP
7460
BC548C
FOR ECD4 VA
FOR ECD4
STSIG
STEREO
CE
COUNTER
CLOCK
7420
HEF4094BP
7450
HEF4051BP
VDD
VSS
VEE
LOGIC LEVEL CONVERSION
1-of-8 DECODER
7451
BA3830S
REFERENCE CURRENT
RESET
DET
BPF
LINEOUT
LINEIN
RECNF
RECIN
RESC
BIASC
GND
LM393N
7452A
7452B
FOR SPECTRUM VERSION ONLY
7403
HEF4094BP
AUX
DBB
TUN UP
PROG
STBY
SPATIAL
TUN DOWN
AUTO PROG
CLK SET
MONO
TAPE
CD
SET T/N
NEWS
TIMER
BAND
TUNER
UP
ON
FLAT
CLASSIC
POP
JAZZ
ROCK
ARE DC
CE OF +-5 %
ON STATE

1401	G 1
1402	I 1
1403	M 1
1404	J10
1404	K11
1405	N15
1406	L 1
1409	M17
1410	I18
1411	I19
1412	I20
1413	I21
1414	I18
1415	I19
1416	I20
1417	I21
1418	J18
1419	J19
1420	J20
1421	J21
1422	J18
1423	J19
1424	J20
1425	J21
1426	K18
1428	K20
1429	K21
1430	L18
1431	L19
1432	L20
1433	L21
1434	L21
1460	L 9
2401	I13
2402	H12
2403	I 9
2405	K 6
2410	J 4
2411	K 4
2413	J 6
2414	J 6
2415	M 7
2417	J 7
2418	J 7
2424	I14
2425	C11
2427	B13
2470	C21
2471	D21
2472	D21
2473	C21
2475	A16
2476	E18
2477	E17
3402	G12
3403	K 4
3404	J 5
3405	J 6
3406	M 6
3407	M 6
3416	I 8
3417	J 8
3418	I 8
3419	J 8
3421	I12
3422	J12
3423	I12
3424	G19
3425	I12
3426	J10
3427	H10
3428	H10
3429	H10
3430	F10
3431	F10
3432	F10
3433	F10
3434	E10
3435	L 6
3436	L 6
3437	H10
3438	H10
3439	G10
3440	E 9
3441	E 8
3442	E 8
3443	E 8
3444	E 8
3445	E 8
3446	E 7
3447	E 7
3449	B 9
3450	G11
3451	G10
3452	F10
3453	E 7
3454	J 9
3456	G11
3460	M 8
3461	L 8
3470	F19
3471	E13
3472	D13
3473	E13
3474	D14
3475	E14
3476	D14
3477	E14
3478	D15
3479	E15
3481	F18
3482	B21
3483	B21
3484	C21
3485	D21
3486	B11
3487	B11
3488	C11
3490	E13
3491	D13
3492	F13
3493	F14
3494	H15
3495	H15
3498	B 5
3525	I 9
5401	J 7
5402	I 6
5403	J 6
5404	G10
5409	I11
5412	I10
5413	I11
5415	I11
6401	H13
6402	G13
6406	M 6
6410	H15
6411	H16
6412	H16
6413	H16
6415	J16
6416	J16
6417	J15
7401	F 7
7402	L 5
7403	I16
7410	K 5
7420	C14
7450	A15
7451	A20
7452A	F17
7452B	G16
7460	M 8
T01	J 2
T010	I 2
T019	M17
T02	J 2
T020	M16
T021	M16
T022	M16
T023	M14
T025	M13
T026	M14
T027	M14
T028	M15
T03	J 2
T032	J10
T034	J11
T036	J11
T037	J11
T038	J11
T039	J11
T04	K 2
T040	J12
T05	N 2
T050	J 2
T06	K 2
T07	N 2
T08	K 2
T09	K 2
T11	J 2
T12	L 8
T13	M 8
T14	M 6
T17	F19
T29	M15
T30	K 4
T35	L 6
T42	G 9
T43	M 2
T44	M 2
T45	M 2
T46	G11
T47	M 2
T48	L 2
T49	L 2
T51	L 2
T52	G11
T53	L 2


TAPE 1
FRONT
BACK
CD
TUNER
SHUFFLE REPEAT 1 PAUSE
1 2 TIMER NEWS
HIGH SPEED RECORD DOLBY CHROME DBB SPATIAL
X1 X2 X3 X4 X5 X6
TAPE 2
FRONT
BACK
kHz
MHz
MHz
AUTO PROGRAM EDIT STEREO FM MW LW SW AM PM
R4
R3
R2
R1
R0
C1
C2
C3
C4
C5

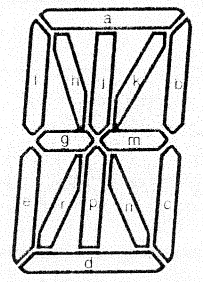

a
b
c
d
e
f
g
h
j
k
m
n
p
r

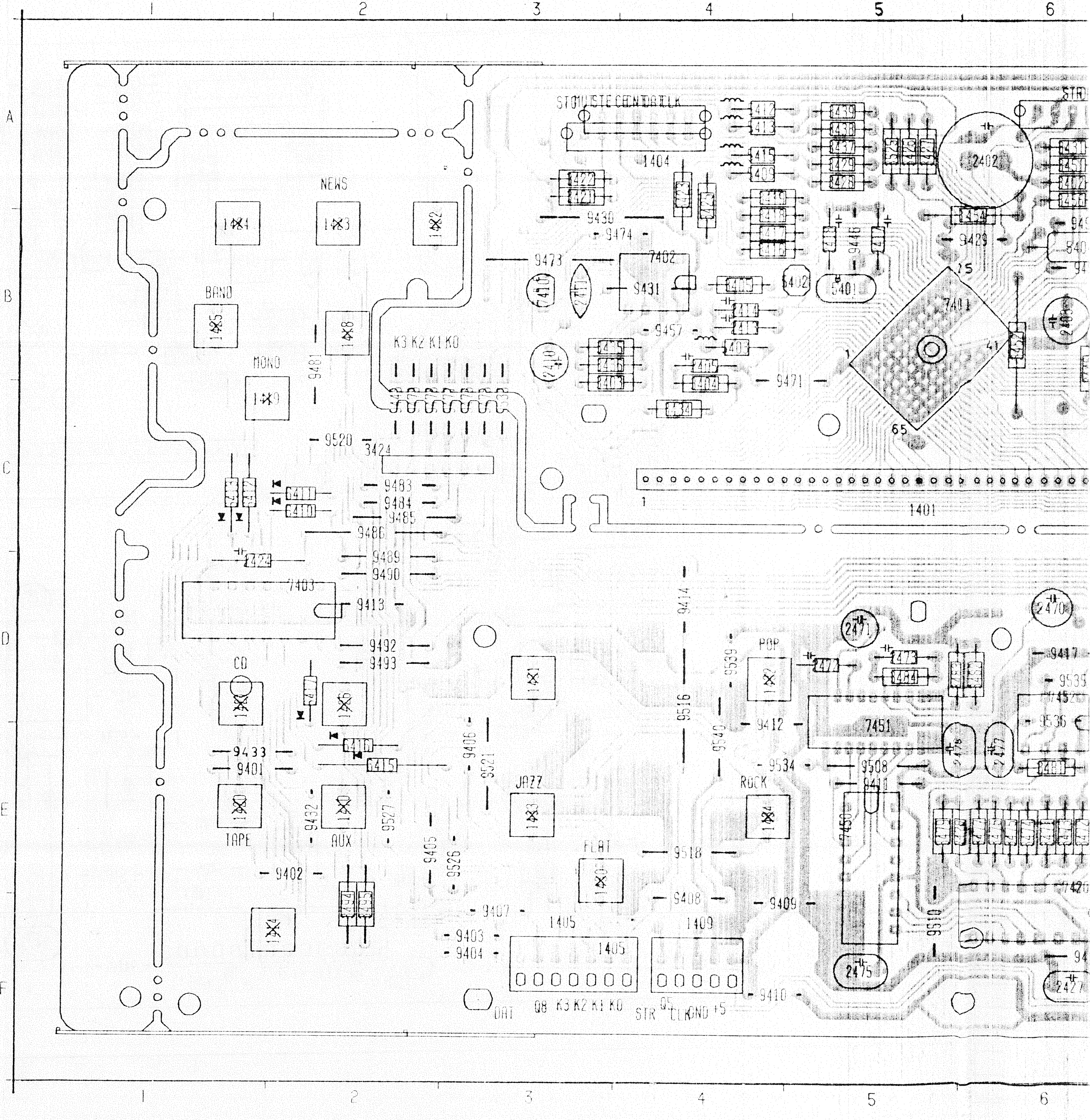
Figure 7. LCD pin connections

LCD DISPLAY PINS CONNECTIONS

PIN NO.	COM 0	COM 1	COM 2	COM 3
1	-	-	COM 2	-
2	-	-	-	COM 3
3	6gm	6f	6e	6n
4	6b	6a	6c	6d
5	FRONT (1)	6h	BACK (1)	TAPE 1,X1
6	SHUFFLE	CD	HIGH SPEED	AUTO
7	5g	5f	5e	PROGRAM
8	5b	5a	5c	5d
9	TUNER	5hn	5m	5jp
10	1 (1), 2	TIMER	RECORD	REPEAT
11	4gm	4f	4e	EDIT
12	4b	4a	4c	4d
13	X7	X9	X8	1 (2)
14	FRONT (2)	X6	BACK (2)	TAPE 2,X2
15	3g	3f	3e	3n
16	3b	3a	3c	3d
17	3k	3h	3m	3jp
18	3r	DBB	PAUSE	STEREO
19	2gm	2f	2e	2n
20	2b	2a	2c	2d
21	2kr	CHROME	DOLBY	2jp
22	LW	-	MW	R0
23	1gm	1f	1e	1n
24	1b	1a	1c	1d
25	COL	1h	FM,P1,MHz (1)	SW,P2,MHz (2)
26	X4	kHz	PM	AM
27	0gm	0f	0e	0n
28	0b	0a	0c	0d
29	X3	X5	SPATIAL	NEWS
30	C1R1	C1R2	C1R3	C1R4
31	C2R1	C2R2	C2R3	C2R4
32	C3R1	C3R2	C3R3	C3R4
33	C4R1	C4R2	C4R3	C4R4
34	C5R1	C5R2	C5R3	C5R4
35	COM 0	-	-	-
36	-	COM 1	-	-

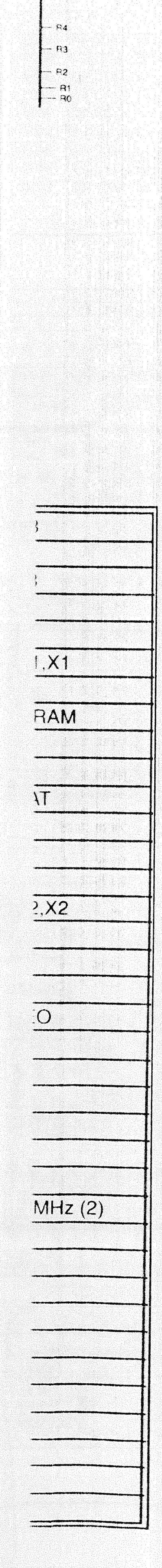
FRONT COMPONENT LAYOUT

1401	C5	1412	B9	1421	D1	1431	D3	2410	B3	2427	F6	3403	C4	3421	B3	3430	B7	3439	A5	3449	A7	3470	C7	3479	E5	3490	E6	5402	B5	6406	E7	7402	B4	9402	
1402	A7	1413	B9	1422	B3	1432	D4	2411	B3	2470	D6	3404	C4	3422	A3	3431	A6	3440	C7	3450	B7	3471	E6	3481	E6	3491	F6	5403	B4	6410	C2	7403	D2	9403	
1403	A7	1414	F2	1423	B2	1433	E3	2413	B4	2471	D5	3405	B4	3423	A4	3432	B7	3441	C7	3451	A6	3472	E6	3482	D5	3492	E6	5404	B6	6411	C2	7410	B3	9404	
1404	A4	1415	E7	1424	B1	1434	E4	2414	B4	2472	D5	3406	F7	3424	C2	3433	B7	3442	C7	3452	B6	3473	E6	3483	D5	3493	E7	5409	A4	6412	C1	7420	F6	9405	
1405	F3	1416	C9	1425	B1	1460	C8	2415	F7	2473	D5	3407	F7	3425	A4	3434	C4	3443	C7	3453	B7	3474	E6	3484	D5	3494	F2	5412	A4	6413	C1	7450	E5	9406	
1406	A7	1417	C9	1426	D2	2401	B8	2417	B5	2475	F5	3416	B4	3426	A5	3435	B4	3444	C6	3454	B6	3475	E6	3485	D8	3495	F2	5413	A4	6415	E2	7451	D5	9407	
1409	F4	1418	B2	1428	B9	2402	A6	2418	B5	2476	E6	3417	B4	3427	A5	3436	C4	3445	C6	3456	B6	3476	E6	3486	B7	3498	A7	5415	A4	6416	E2	7452	D6	9408	
1410	E2	1419	C2	1429	B8	2403	B6	2424	D2	2477	E6	3418	B4	3428	A5	3437	A5	3446	C6	3460	E7	3477	E6	3487	E7	3525	A5	6401	B7	6417	D2	7460	E7	9409	
1411	D7	1420	E1	1430	F4	2405	C4	2425	E7	3402	A6	3419	B4	3429	A5	3438	A5	3447	C6	3461	D8	3478	E5	3488	E7	5401	B5	6402	B7	7401	B5	9401	E2	9410	


1
2
3
4
5
6
A
B
C
D
E
F
NEWS
BAND
MONO
CD
TAPE
AUX
JAZZ
FLAT
POP
ROCK
1401
1404
1405
1409
7401
7402
7403
7451
K3 K2 K1 K0
GND
Q8 K3 K2 K1 K0
STR
+5

FRONT COMPONENT LAYOUT

1401	C5	1412	B9	1421	D1	1431	D3	2410	B3	2427	F6	3403	C4	3421	B3	3430	B7	3439	A5	3449	A7	3470	C7	3479	E5	3490	E6	5402	B5	6406	E7	7402	B4	9402	E2	9411	E5	9420	D6	9430	B4	9461	C8	9475	C3	9486	C2	9503	D7	9521	E3
1402	A7	1413	B9	1422	B3	1432	D4	2411	B3	2470	D6	3404	C4	3422	A3	3431	A6	3440	C7	3450	B7	3471	E6	3481	E6	3491	F6	5403	B4	6410	C2	7403	D2	9403	F3	9412	E4	9421	D8	9431	B4	9462	C8	9476	C3	9489	D2	9504	D7	9526	F2
1403	A7	1414	F2	1423	B2	1433	E3	2413	B4	2471	D5	3405	B4	3423	A4	3432	B7	3441	C7	3451	A6	3472	E6	3482	D5	3492	E6	5404	B6	6411	C2	7410	B3	9404	F3	9413	D2	9422	E7	9432	E2	9463	C8	9477	C2	9490	D2	9505	D7	9527	E2
1404	A4	1415	E7	1424	B1	1434	E4	2414	B4	2472	D5	3406	F7	3424	C2	3433	B7	3442	C7	3452	B6	3473	E6	3483	D5	3493	E7	5409	A4	6412	C1	7420	F6	9405	F2	9414	D4	9424	A8	9445	C2	9464	C8	9478	C2	9492	D2	9506	D6	9530	C3
1405	F3	1416	C9	1425	B1	1460	C8	2415	F7	2473	D5	3407	F7	3425	A4	3434	C4	3443	C7	3453	B7	3474	E6	3484	D5	3494	F2	5412	A4	6413	C1	7450	E5	9406	E3	9415	E7	9425	B8	9446	B5	9466	B7	9479	C2	9493	D2	9508	E5	9534	E5
1406	A7	1417	C9	1426	D2	2401	B8	2417	B5	2475	F5	3416	B4	3426	A5	3435	B4	3444	C6	3454	B6	3475	E6	3485	D8	3495	F2	5413	A4	6415	E2	7451	D5	9407	F3	9416	F6	9426	C7	9457	B4	9467	B7	9481	B2	9495	B6	9510	F5	9535	D6
1409	F4	1418	B2	1428	B9	2402	A6	2418	B5	2476	E6	3417	B4	3427	A5	3436	C4	3445	C6	3456	B6	3476	E6	3486	B7	3498	A7	5415	A4	6416	E2	7452	D6	9408	F4	9417	D6	9427	A7	9458	C8	9471	C5	9483	C2	9496	B6	9516	E4	9536	E6
1410	E2	1419	C2	1429	B8	2403	B6	2424	D2	2477	E6	3418	B4	3428	A5	3437	A5	3446	C6	3460	E7	3477	E6	3487	E7	3525	A5	6401	B7	6417	D2	7460	E7	9409	F5	9418	C8	9428	C7	9459	C8	9473	B3	9484	C2	9501	D7	9518	E4	9539	D4
1411	D7	1420	E1	1430	F4	2405	C4	2425	E7	3402	A6	3419	B4	3429	A5	3438	A5	3447	C6	3461	D8	3478	E5	3488	E7	5401	B5	6402	B7	7401	B5	9401	E2	9410	F4	9419	C8	9429	B6	9460	C8	9474	B4	9485	C2	9502	D7	9520	C2	9540	D4


R4
R3
R2
R1
R0
.X1
RAM
AT
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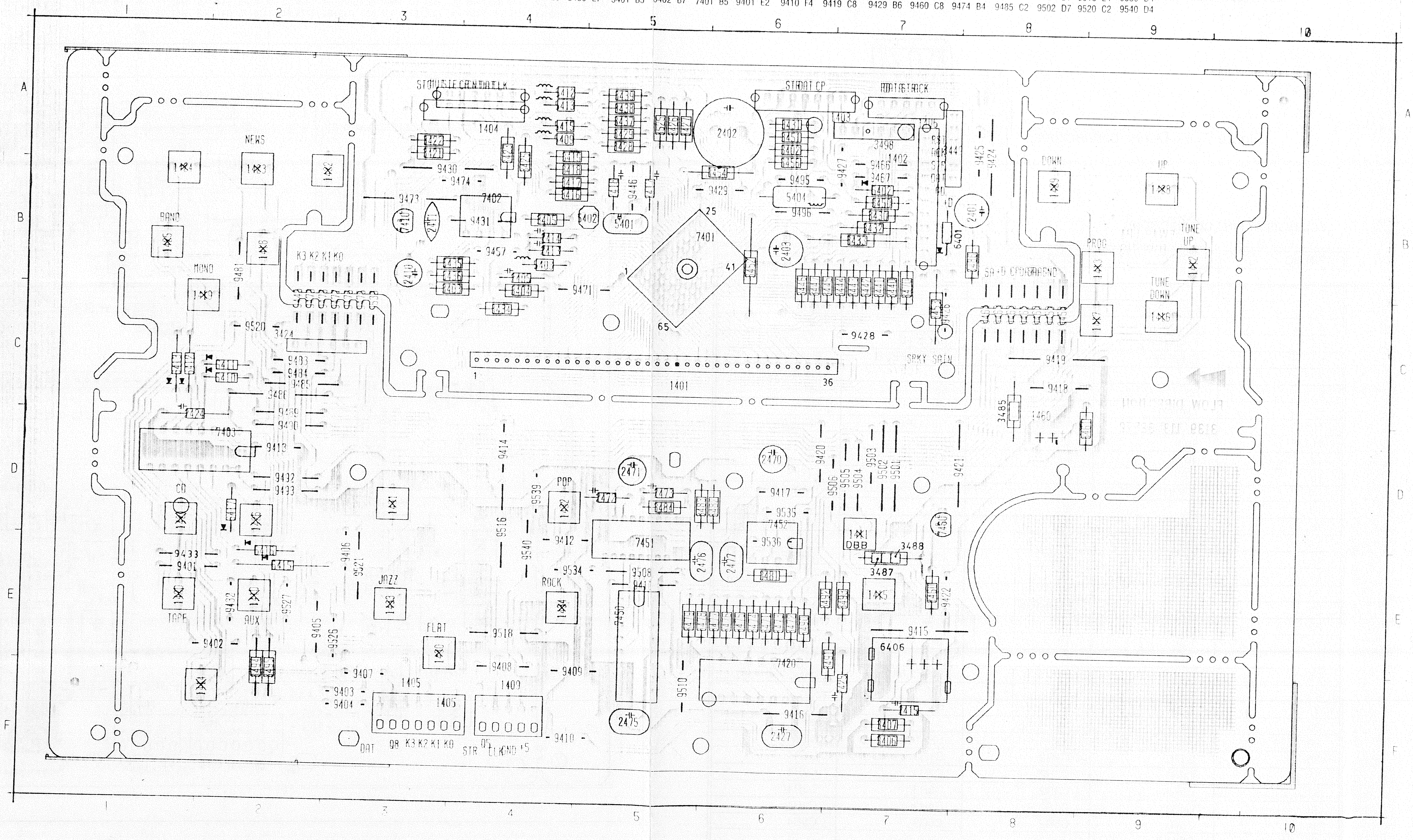
O
MHz (2)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JAZZ
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ROCK
DOWN
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PROG
TUNE UP
TUNE DOWN
DBB
STBDAT CP
SPKY SPIN
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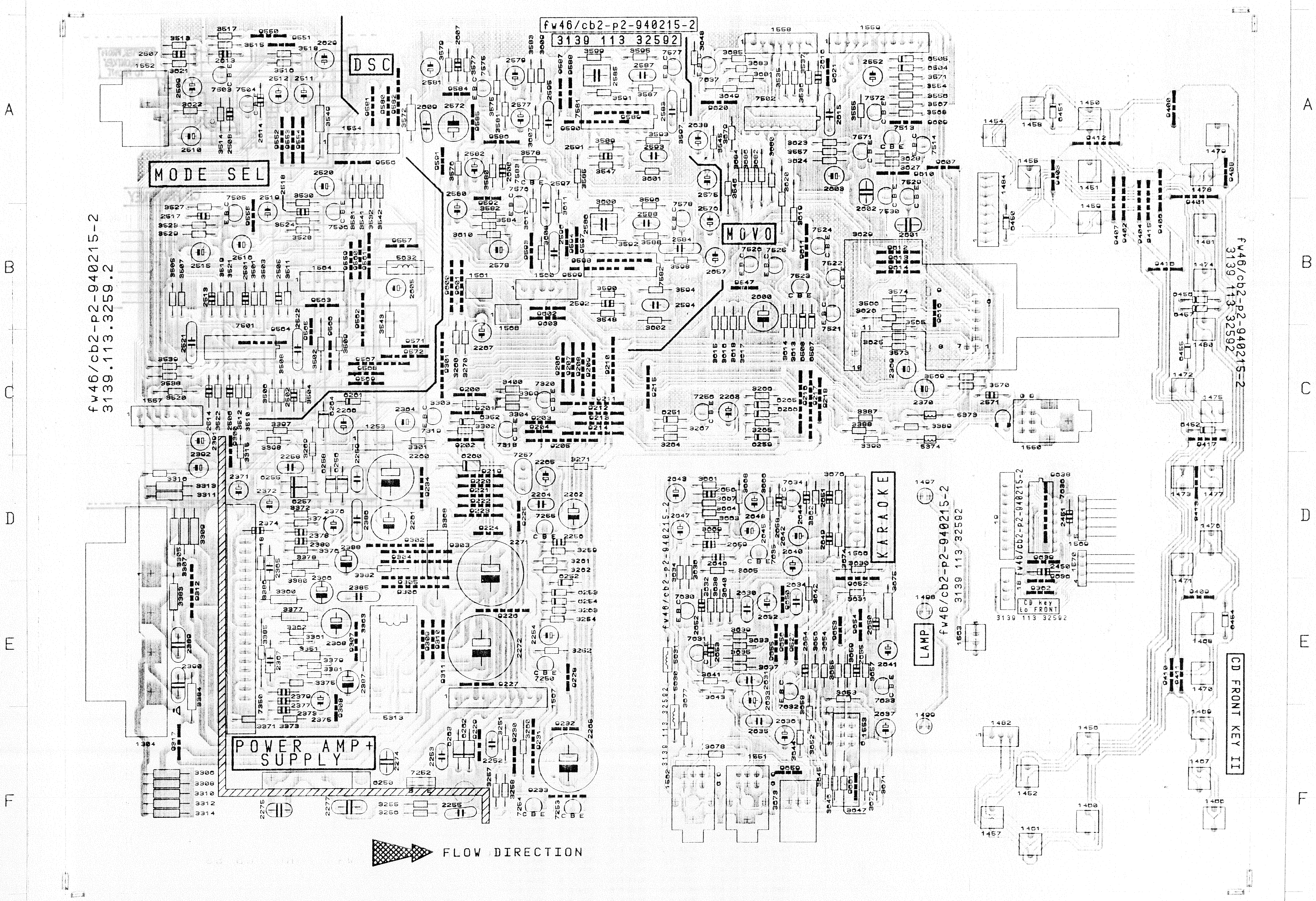
COMBI COMPONENT LAYOUT



NOTE: THIS LAYOUT IS COMPLETE FOR ALL VERSIONS/OPTIONS
FOR DIFFERENCES PLEASE REFER TO SCHEMATIC DIAGRAM

18	E	8	2388	D	3	3254	E	4
19	D	8	2389	E	1	3255	F	3
1253	C	3	2390	E	1	3256	F	3
1304	E	1	2391	C	1	3257	F	4
1450	A	8	2392	D	1	3258	F	4
1451	A	8	2450	D	8	3259	D	4
1452	F	8	2451	D	8	3260	F	4
1454	A	8	2501	B	2	3261	D	4
1455	A	8	2502	C	2	3262	D	4
1456	F	8	2505	B	2	3263	E	4
1457	F	8	2506	C	2	3264	C	5
1458	A	8	2507	A	1	3265	C	6
1459	B	8	2508	A	2	3266	C	6
1460	F	8	2509	A	1	3267	C	5
1461	F	8	2510	A	1	3268	C	3
1466	F	9	2511	A	2	3269	C	2
1467	F	9	2512	A	2	3270	C	3
1468	E	9	2513	B	2	3271	D	4
1469	F	9	2514	C	1	3301	C	3
1470	E	9	2515	B	1	3302	C	3
1471	D	9	2516	B	2	3303	C	4
1472	C	9	2517	B	1	3304	C	4
1473	D	9	2518	B	2	3305	D	1
1474	B	9	2519	B	2	3306	F	1
1475	C	9	2520	A	2	3307	D	1
1476	D	9	2521	C	1	3308	F	1
1477	D	9	2522	C	2	3309	D	1
1478	A	9	2552	A	7	3310	F	1
1479	A	9	2571	C	8	3311	D	1
1480	C	9	2572	A	3	3312	F	1
1481	B	9	2575	A	5	3313	D	1
1482	F	8	2576	B	5	3314	F	1
1484	B	8	2577	A	4	3315	C	2
1497	D	7	2578	B	4	3316	D	1
1498	E	7	2579	A	4	3351	E	2
1499	F	7	2580	B	3	3360	E	2
1550	C	8	2581	A	3	3361	E	2
1551	F	6	2582	A	4	3362	E	2
1552	A	1	2583	A	5	3363	E	3
1553	F	7	2584	B	5	3368	E	3
1554	A	3	2585	A	5	3371	F	2
1557	C	1	2586	B	5	3372	D	2
1558	A	6	2587	A	5	3373	F	2
1559	A	7	2588	B	5	3374	D	2
1560	B	4	2591	A	5	3375	E	2
1561	B	4	2592	B	5	3376	D	2
1562	F	5	2593	A	5	3377	E	2
1563	E	8	2594	B	5	3378	D	2
1564	B	2	2595	A	4	3379	E	2
1566	D	7	2596	B	4	3380	D	2
1567	E	4	2597	B	4	3381	E	2
1568	B	4	2600	B	6	3382	D	3
1569	D	8	2601	B	7	3383	E	1
1570	D	8	2602	A	7	3384	E	1
2252	F	4	2603	A	6	3385	E	2
2253	F	3	2605	B	3	3386	D	2
2254	E	4	2607	A	3	3387	C	7
2255	F	3	2608	A	4	3388	C	7
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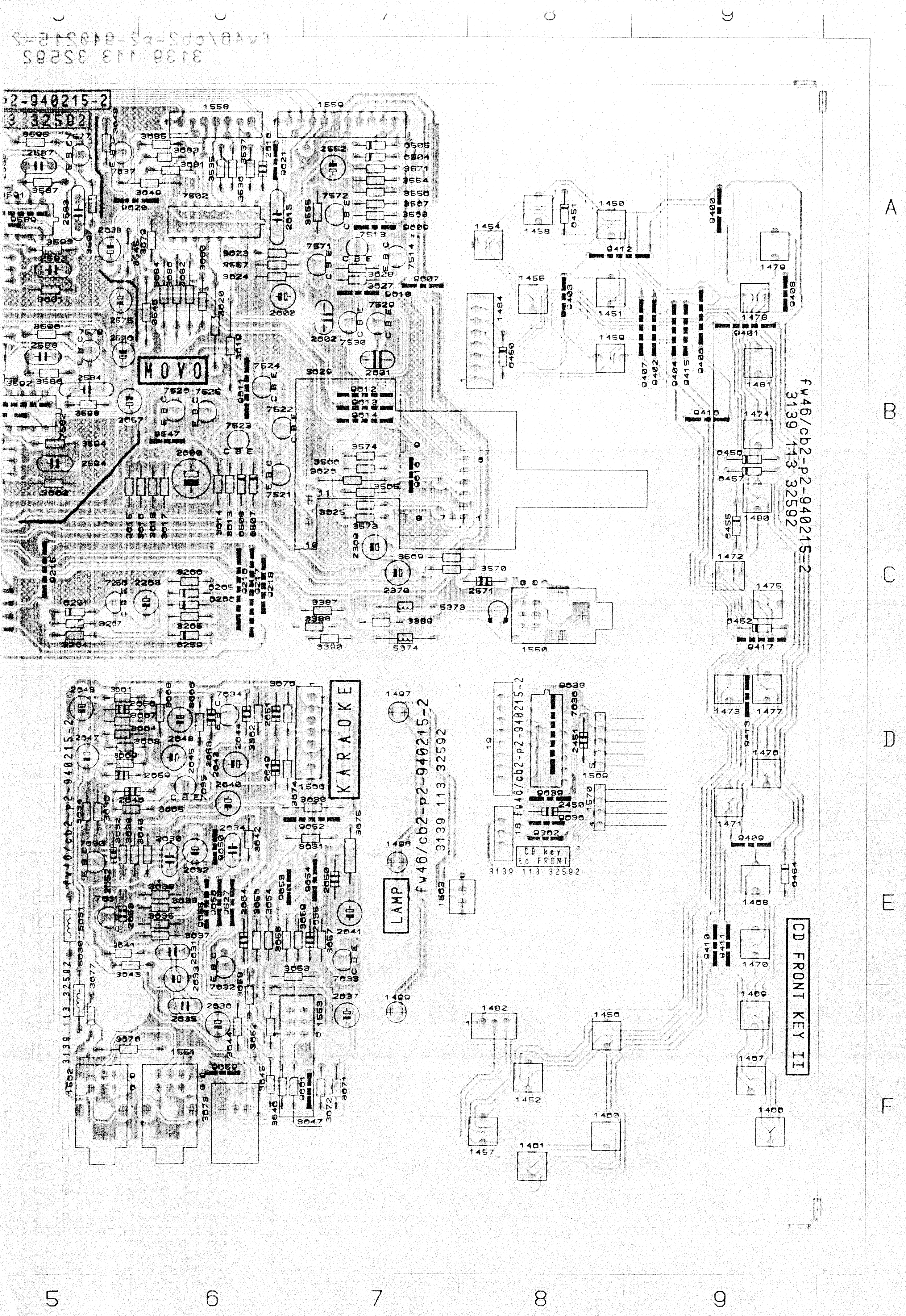
2258	D	2	2613	A	2	3390	C	7
2259	D	3	2614	A	2	3397	C	2
2260	D	3	2615	A	6	3398	C	2
2261	D	3	2616	A	6	3399	C	4
2262	D	4	2629	A	2	3400	C	4
2263	C	6	2630	E	6	3501	B	2
2264	D	4	2631	E	6	3502	C	2
2265	D	4	2632	E	6	3503	B	2
2266	C	3	2633	E	6	3504	C	2
2267	C	4	2634	E	6	3505	B	1
2268	F	4	2635	F	6	3506	C	2
2271	D	4	2636	F	6	3507	B	1
2272	E	4	2637	F	7	3508	C	2
2274	F	3	2638	A	5	3509	C	3
2275	F	2	2640	D	6	3510	C	2
2277	F	3	2641	E	7	3511	B	2
2364	C	3	2642	D	6	3512	C	2
2365	D	2	2643	D	5	3513	A	1
2366	E	2	2644	D	6	3514	A	2
2367	E	2	2645	D	6	3515	A	2
2368	E	2	2646	D	5	3516	A	2
2369	C	7	2647	D	5	3517	A	2
2370	C	7	2648	D	6	3518	A	2
2371	D	2	2649	D	6	3519	B	2
2372	D	2	2650	E	7	3520	C	1
2373	F	2	2651	D	6	3521	B	2
2374	D	2	2652	E	5	3522	C	2
2375	E	2	2653	E	5	3523	B	1
2376	D	2	2654	E	6	3524	B	2
2377	E	2	2655	E	7	3527	B	1
2378	D	2	2656	D	5	3528	B	2
2379	E	2	2657	B	5	3529	B	1
2380	D	2	2658	D	6	3530	B	2
2385	E	3	2659	D	5	3531	A	3
2386	D	3	3251	F	4	3532	A	3
2387	E	3	3252	E	4	3535	A	6



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19 D 8	2389 E 1	3255 F 3	3537 A 6	3652 F 6	7571 A 7	9561 B 3
1253 C 3	2390 E 1	3256 F 3	3538 C 1	3653 E 6	7572 A 7	9562 B 3
1304 E 1	2391 C 1	3257 F 4	3539 C 1	3654 E 6	7575 A 4	9563 B 2
1450 A 8	2392 D 1	3258 F 4	3541 A 3	3655 E 6	7576 B 4	9564 C 2
1451 A 8	2450 D 8	3259 D 4	3542 A 3	3656 E 6	7577 A 5	9565 C 2
1452 F 8	2451 D 8	3260 F 4	3543 B 3	3657 E 7	7578 B 5	9566 C 2
1454 A 8	2501 B 2	3261 D 4	3545 A 5	3658 F 6	7581 A 5	9567 C 3
1455 A 8	2502 C 2	3262 D 4	3546 A 6	3659 E 7	7582 B 5	9568 C 3
1456 F 8	2505 B 2	3263 E 4	3547 A 5	3661 D 5	7583 A 4	9569 C 3
1457 F 8	2506 C 2	3264 C 5	3548 B 5	3662 D 6	7630 E 5	9571 C 3
1458 A 8	2507 A 1	3265 C 6	3549 A 2	3663 D 5	7631 E 5	9572 C 3
1459 B 8	2508 A 2	3266 C 6	3554 A 7	3664 D 5	7632 E 6	9580 A 3
1460 F 8	2509 A 1	3267 C 5	3555 A 7	3665 D 5	7633 E 7	9581 A 3
1461 F 8	2510 A 1	3268 C 3	3556 A 7	3666 D 6	7634 D 6	9582 A 3
1466 F 9	2511 A 2	3269 C 2	3557 A 6	3667 D 5	7635 D 6	9584 A 3
1467 F 9	2512 A 2	3270 C 3	3565 C 7	3668 D 6	7636 D 8	9585 A 4
1468 E 9	2513 B 2	3271 D 4	3566 B 7	3669 D 5	7637 A 5	9586 A 4
1469 F 9	2514 C 1	3301 C 3	3567 A 7	3671 F 7	9200 C 4	9587 A 4
1470 E 9	2515 B 1	3302 C 3	3568 A 7	3672 F 7	9201 C 4	9588 A 4
1471 D 9	2516 B 2	3303 C 4	3569 C 7	3673 F 6	9202 C 4	9589 A 5
1472 C 9	2517 B 1	3304 C 4	3570 C 7	3674 D 6	9203 C 4	9590 A 5
1473 D 9	2518 B 2	3305 D 1	3571 A 7	3675 E 7	9204 C 4	9591 A 3
1474 B 9	2519 B 2	3306 F 1	3572 A 3	3676 D 6	9205 C 4	9592 A 4
1475 C 9	2520 A 2	3307 D 1	3573 C 7	3677 F 5	9206 C 4	9593 B 4
1476 D 9	2521 C 1	3308 F 1	3574 B 7	3678 F 5	9208 E 3	9594 B 4
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1480 C 9	2572 A 3	3312 F 1	3578 A 4	3682 A 6	9212 C 5	9600 B 3
1481 B 9	2575 A 5	3313 D 1	3579 A 3	3683 A 6	9213 C 5	9601 B 3
1482 F 8	2576 B 5	3314 F 1	3580 A 4	3684 A 6	9214 C 5	9602 B 4
1484 B 8	2577 A 4	3315 C 2	3581 A 4	3685 A 6	9215 C 5	9603 B 4
1497 D 7	2578 B 4	3316 D 1	3582 B 4	3686 A 6	9216 C 6	9607 A 7
1498 E 7	2579 A 4	3351 E 2	3583 A 4	5313 E 3	9217 C 6	9610 A 7
1499 F 7	2580 B 3	3360 E 2	3584 B 4	5373 C 7	9218 C 6	9611 B 6
1550 C 8	2581 A 3	3361 E 2	3585 A 4	5374 C 7	9219 D 4	9612 B 7
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1562 F 5	2593 A 5	3377 E 2	3596 B 5	6256 D 3	9229 F 4	9652 E 7
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1564 B 2	2595 A 4	3379 E 2	3598 B 5	6258 D 2	9231 F 4	9654 E 7
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1567 E 4	2597 B 4	3381 E 2	3600 B 5	6260 D 4	9233 F 4	9656 E 6
1568 B 4	2600 B 6	3382 D 3	3601 A 5	6261 C 3	9234 D 3	9659 F 6
1569 D 8	2601 B 7	3383 E 1	3602 B 5	6262 F 4	9300 C 2	9661 F 7
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2252 F 4	2603 A 6	3385 E 2	3608 B 4	6264 C 2	9302 D 3	
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2256 D 4	2609 A 3	3389 C 7	3612 B 4	6450 B 8	9306 E 3	
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2259 D 3	2614 A 2	3397 C 2	3614 B 6	6452 C 9	9308 C 4	
2260 D 3	2615 A 6	3398 C 2	3615 B 5	6454 E 9	9309 E 3	
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2262 D 4	2629 A 2	3400 C 4	3617 B 6	6456 B 9	9311 E 3	
2263 C 6	2630 E 6	3501 B 2	3618 B 6	6457 B 9	9312 E 1	
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2265 D 4	2632 E 6	3503 B 2	3620 A 6	6505 A 7	9317 F 1	
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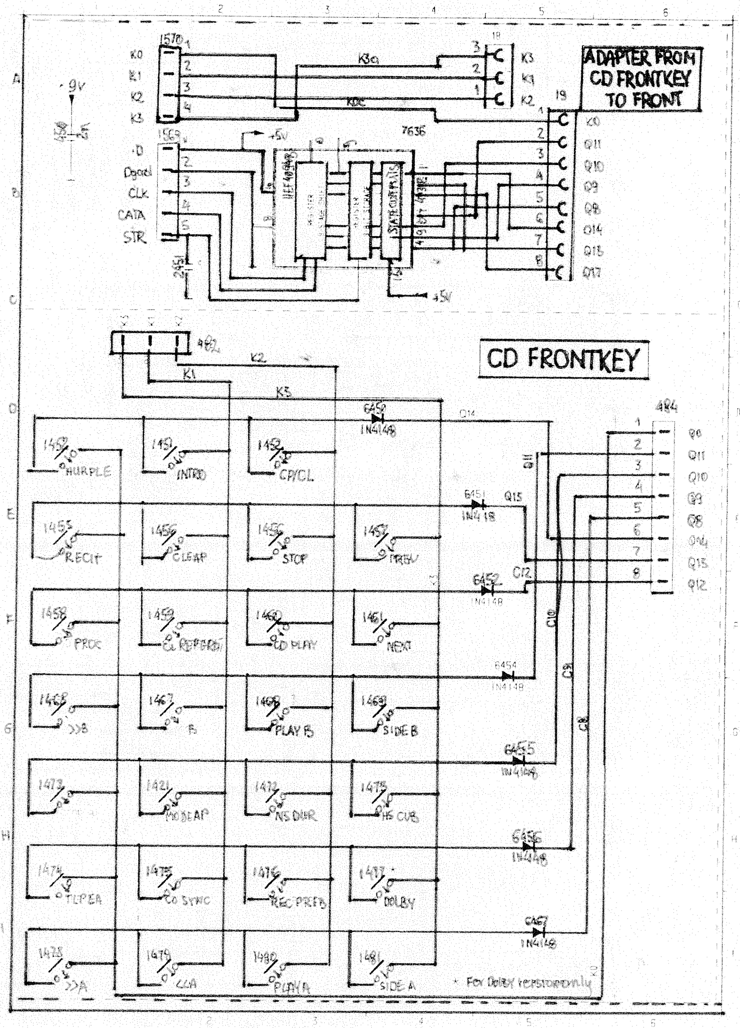
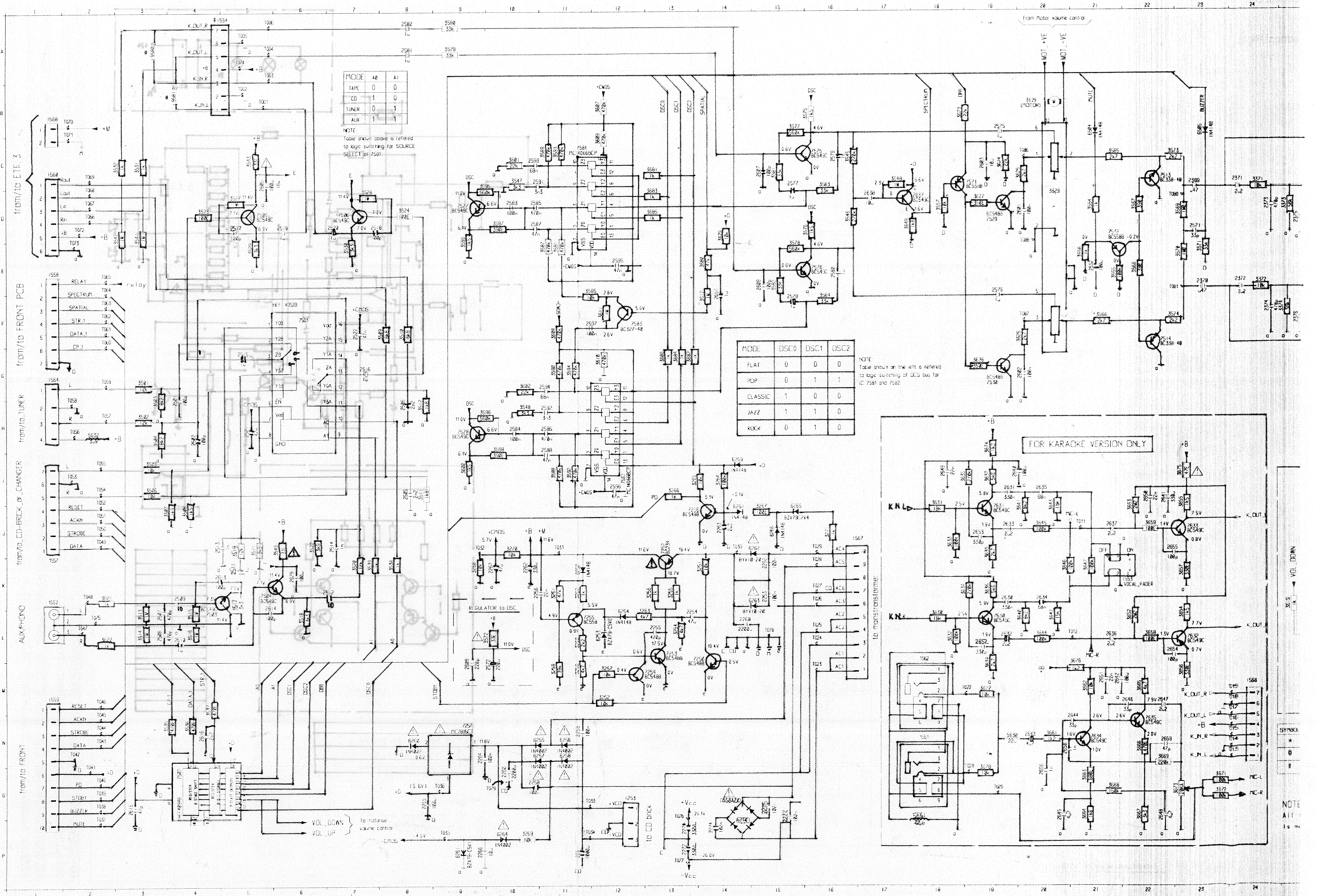
2267 C 4	2634 E 6	3505 B 1	3622 A 1	6508 B 6	9400 A 9	
2268 F 4	2635 F 6	3506 C 2	3623 A 6	7250 E 4	9401 A 9	
2271 D 4	2636 F 6	3507 B 1	3624 A 6	7252 F 3	9402 B 9	
2272 E 4	2637 F 7	3508 C 2	3625 C 7	7253 F 4	9403 A 8	
2274 F 3	2638 A 5	3509 C 3	3626 B 7	7254 F 4	9404 B 9	
2275 F 2	2640 D 6	3510 C 2	3627 A 7	7255 D 4	9406 A 9	
2277 F 3	2641 E 7	3511 B 2	3628 A 7	7256 C 5	9407 B 9	
2364 C 3	2642 D 6	3512 C 2	3629 B 7	7257 D 4	9408 A 9	
2365 D 2	2643 D 5	3513 A 1	3630 D 7	7318 C 4	9409 E 9	
2366 E 2	2644 D 6	3514 A 2	3631 E 7	7319 C 3	9410 E 9	
2367 E 2	2645 D 6	3515 A 2	3632 E 5	7320 C 4	9411 E 9	
2368 E 2	2646 D 5	3516 A 2	3633 E 6	7350 E 2	9412 A 8	
2369 C 7	2647 D 5	3517 A 2	3634 D 5	7501 C 2	9413 D 9	
2370 C 7	2648 D 6	3518 A 2	3635 E 6	7502 A 6	9415 B 9	
2371 D 2	2649 D 6	3519 B 2	3636 D 5	7503 A 2	9416 B 9	
2372 D 2	2650 E 7	3520 C 1	3637 E 6	7504 A 2	9417 C 9	
2373 F 2	2651 D 6	3521 B 2	3638 E 6	7505 B 2	9527 E 6	
2374 D 2	2652 E 5	3522 C 2	3639 E 6	7506 B 2	9547 B 6	
2375 E 2	2653 E 5	3523 B 1	3640 E 6	7513 A 7	9550 A 2	
2376 D 2	2654 E 6	3524 B 2	3641 E 5	7514 A 7	9551 A 2	
2377 E 2	2655 E 7	3527 B 1	3642 E 6	7521 B 6	9552 A 2	
2378 D 2	2656 D 5	3528 B 2	3643 E 5	7522 B 6	9553 A 2	
2379 E 2	2657 B 5	3529 B 1	3644 F 6	7523 B 6	9554 A 2	
2380 D 2	2658 D 6	3530 B 2	3645 F 6	7524 B 6	9555 B 2	
2385 E 3	2659 D 5	3531 A 3	3646 F 6	7525 B 6	9556 A 3	
2386 D 3	3251 F 4	3532 A 3	3647 F 6	7526 B 6	9557 B 3	
2387 E 3	3252 E 4	3535 A 6	3648 A 5	7529 A 7	9559 B 3	

COMBI CIRCUIT I

1450 D 1	1456 E 3	1461 F 4	1470 H 1	1475 H 2	1480 I 3	1570 A 1	6450 D 4	6456 H 5
1451 D 2	1457 E 4	1466 G 1	1471 H 2	1476 H 3	1481 I 4	18 A 5	6451 E 4	6457 I 5
1452 D 3	1458 F 1	1467 G 2	1472 H 3	1477 H 4	1482 C 2	19 A 5	6452 F 5	7636 A 4
1454 E 1	1459 F 2	1468 G 3	1473 H 4	1478 I 1	1484 D 6	2450 A 1	6454 F 5	
1455 E 2	1460 F 3	1469 G 4	1474 H 1	1479 I 2	1569 A 1	2451 C 2	6455 G 5	



COMBI CIRCUIT II

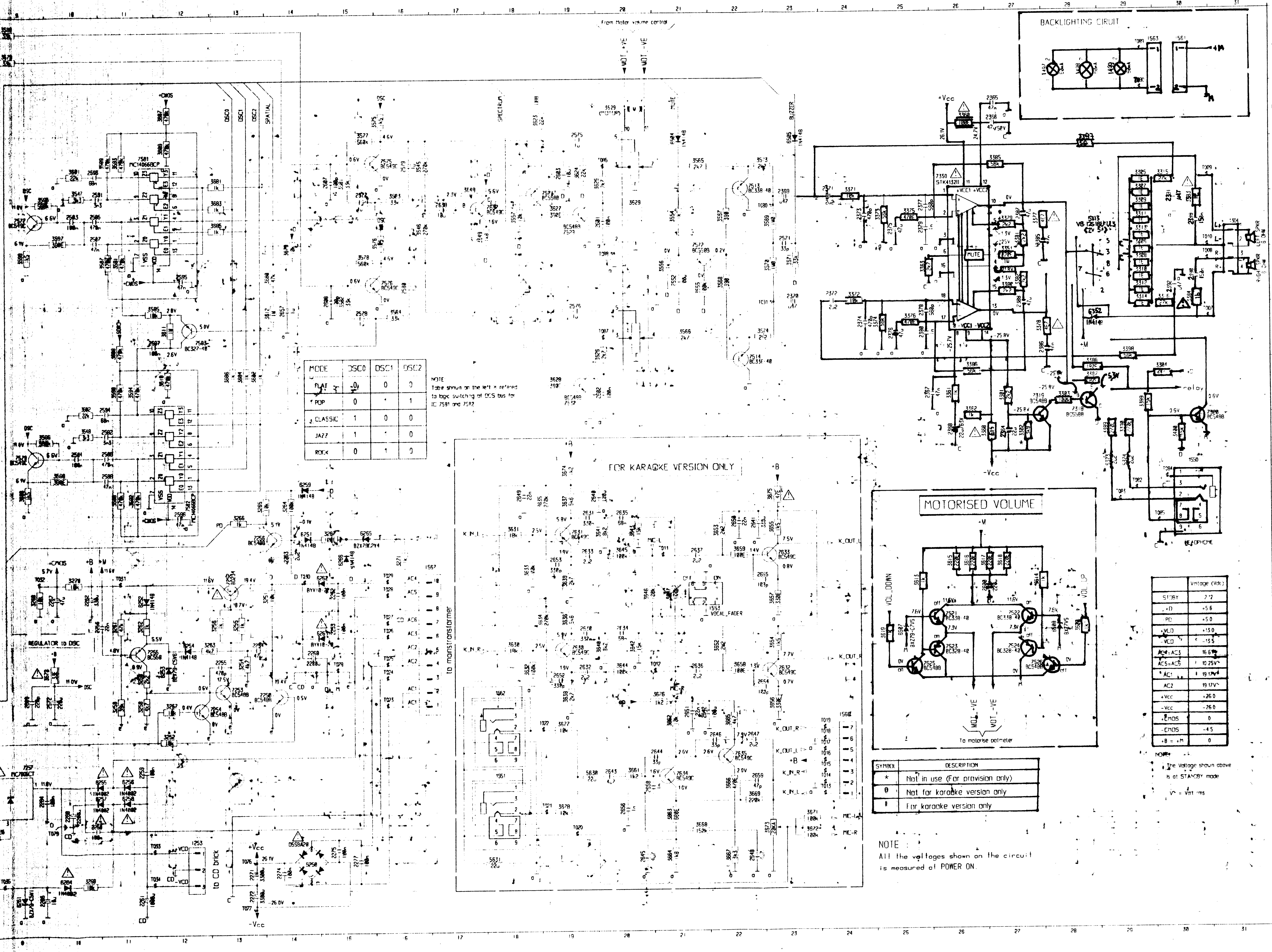

from/to ETE 3
from/to FRONT PCB
from/to TUNER
from/to CD-BRICK or CHANGER
AUX/PHONO
from/to FRONT
From Motor volume control
MOT +VE
MOT -VE
SPECTRUM
DBB
MUTE
BUZZER
DSC0
DSC1
DSC2
SPATIAL
HEF 4052B
7501
7581 MC14066BCP
7582 MC14066BCP
REGULATOR to DSC
7257 MC7805CT
to mainstransformer
to CD DICK
VOL_DOWN
VOL_UP
To motorise volume control
FOR KARAOKE VERSION ONLY
VOCAL FADER
K_OUT_R
K_OUT_L
K_IN_R
K_IN_L
MIC-L
MIC-R
RELAY
SPECTRUM
SPATIAL
STR_1
DATA_1
CP_1
RESET
ACKN
STROBE
DATA
PD
STDBY
BUZZER
MUTE

MODE	A0	A1
TAPE	0	0
CD	1	0
TUNER	0	1
AUX	1	1

NOTE
Table shown above is refered to logic switching for SOURCE SELECT of 7501

MODE	DSC0	DSC1	DSC2
FLAT	0	0	0
POP	0	1	1
CLASSIC	1	0	0
JAZZ	1	1	0
ROCK	0	1	0

NOTE
Table shown on the left is refered to logic switching of DCS bus for IC 7581 and 7582



MODE	DSC0	DSC1	DSC2
FLAT	0	0	0
POP	0	1	1
CLASSIC	1	0	0
JAZZ	1	1	0
ROCK	0	1	0

NOTE
Table shown on the left is refered to logic switching of DCS bus for IC 7581 and 7582

	Voltage (Vdc)
STDBY	2 2
+D	+5 6
PD	+5 0
+VCD	+13 0
-VCD	-13 5
AC4=AC3	16 6V~
AC5=AC6	10 25V~
AC1	19 17V~
AC2	19 17V~
+Vcc	+26 0
-Vcc	-26 0
+CMOS	0
-CMOS	-4 5
+B = +M	0

NOTE :
- The Voltage shown above is at STANDBY mode
- V~ = Volt rms

SYMBOL	DESCRIPTION
*	Not in use (For provision only)
θ	Not for karaoke version only
#	For karaoke version only

NOTE :
All the voltages shown on the circuit is measured at POWER ON.

1253	O12
1304	D31
1497	A28
1498	A28
1499	A29
1550	H30
1551	N18
1552	K 1
1553	K22
1554	A 5
1557	K 1
1558	F 1
1559	M 1
1560	C 1
1561	A30
1562	M18
1563	A30
1564	G 1
1566	M24
1567	J17
1568	B 1
2252	K15
2253	K15
2254	L13
2255	L13
2256	K10
2258	D10
2259	N11
2260	D10
2261	P11
2262	K10
2263	J14
2264	N 9
2265	O 8
2266	P 9
2267	K10
2268	L14
2271	P13
2272	P13
2274	P14
2275	D15
2277	P15
2364	H27
2365	B27
2366	B27
2367	G25
2368	H26
2369	C23
2370	E23
2371	C24
2372	E24
2373	D24
2374	F24
2375	D25
2376	F25
2377	D25
2378	F25
2379	D25
2380	F25
2385	D27
2386	F28
2387	D27
2388	E27
2389	C30
2390	E30
2391	C30
2392	E30
2501	H 4
2502	H 4
2505	I 8
2506	H 8
2507	L 3
2508	L 3
2509	K 4
2510	L 4
2511	K 5
2512	K 7
2513	J 4
2514	J 7
2515	G 5
2516	G 7
2517	D 5
2518	D 7
2519	D 6
2520	D 2
2521	H 5
2522	F 7
2552	E21
2571	D23
2572	M10
2575	B19
2576	F19
2577	C15
2578	F15
2579	C16
2580	E16
2581	A 8
2582	A 8
2583	D10
2584	H10
2585	D10
2586	H11
2587	D10
2588	I11
2591	C10
2592	H11
2593	C10
2594	G11
2595	E12
2596	I12
2597	F11
2600	K28
2601	D20
2602	D20
2603	C19
2605	C 5
2607	C15
2608	E15
2609	M 9
2613	K 4
2614	L 5
2615	O 3
2616	N 4
2629	K 6
2630	K19
2631	I19
2632	L19
2633	J19
2634	K20
2635	I20
2636	L21
2637	J21
2638	D17
2640	I19
2641	I22
2642	M21
2643	N20
2644	N21
2645	O20
2646	M22
2647	M22
2648	O22
2649	I18
2650	I22
2651	M21
2652	L19
2653	J19
2654	L22
2655	J22
2656	O20
2657	F14
2658	N20
2659	N22
3251	K14
3252	M12
3254	L13
3255	K13
3256	K13
3257	M12
3258	M11
3259	M11
3260	L11
3261	K11
3262	K11
3263	L12
3264	I14
3265	I13
3266	I13
3267	J15
3268	K 9
3269	P10
3270	J10
3271	J16
3301	G27
3302	H27
3303	G28
3304	G30
3305	C29
3306	D29
3307	C29
3308	E29
3309	D29
3310	E29
3311	D29
3312	E29
3313	D29
3314	E29
3315	C30
3316	E30
3351	E27
3360	B26
3361	G26
3362	G26
3363	E25
3368	H26
3371	C24
3372	E24
3373	D25
3374	F25
3375	D25
3376	F25
3377	D27
3378	F27
3379	D27
3380	E27
3381	D27
3382	E27
3383	D30
3384	E30
3385	C27
3386	G26
3387	G28
3388	G28
3389	H29
3390	H29
3397	C28
3398	F29
3399	G29
3400	H30
3501	G 3
3502	H 3
3503	H 3
3504	H 3
3505	I 3
3506	I 3
3507	J 3
3508	J 4
3509	F 8
3510	F 8
3511	I 8
3512	H 8
3513	I 3
3514	L 3
3515	L 4
3516	L 4
3517	K 5
3518	L 6
3519	J 5
3520	K 7
3521	J 5
3522	J 6
3523	D 4
3524	D 8
3527	D 5
3528	D 7
3529	E 5
3530	E 7
3531	C 3
3532	C 3
3535	N 3
3536	N 4
3537	M 4
3538	K 8
3539	K 7
3541	D 3
3542	D 3
3543	C 5
3545	C16
3546	D16
3547	C10
3548	H10
3549	J 6
3554	D21
3555	E21
3556	E21
3557	D18
3565	C21
3566	F21
3567	D22
3568	E22
3569	D23
3570	E23
3571	E23
3572	L10
3573	C22
3574	F22
3575	B16
3576	D16
3577	B15
3578	E15
3579	A 9
3580	A 9
3581	C15
3582	E15
3583	C16
3584	F16
3585	E11
3587	E11
3588	I11
3589	C11
3590	G11
3591	F11
3592	I11
3593	C11
3594	G11
3595	C 9
3596	H 9
3597	D10
3598	H10
3599	E 9
3600	I 9
3601	C10
3602	G10
3607	B12
3608	F11
3609	C12
3610	G12
3611	F12
3612	F14
3613	K25
3614	K27
3615	J26
3616	J26
3617	J26
3618	J27
3619	K25
3620	K28
3621	K 2
3622	L 2
3623	B18
3624	C19
3625	C20
3626	F20
3627	D19
3628	G19
3629	D20
3630	L18
3631	J18
3632	L18
3633	J18
3634	K18
3635	I18
3636	K19
3637	I19
3638	M19
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3641	J20
3642	L20
3643	J20
3644	L20
3645	J20
3646	K20
3647	K21
3648	C17
3649	D17
3652	L22
3653	J22
3654	L23
3655	J23
3656	M23
3657	K23
3658	L22
3659	J22
3661	N20
3662	M21
3663	O21
3664	O21
3665	M22
3666	N22
3667	O22
3668	O21
3669	N22
3671	O23
3672	O23
3673	O23
3674	H19
3675	I23
3676	L21
3677	M19
3678	O19
3679	D14
3680	E14
3681	C13
3682	G13
3683	D13
3684	G13
3685	D13
3686	G13
5313	D28
5373	H29
5374	H29
5630	N19
5631	P18
5632	H 2
6250	D14
6251	J14
6252	K11
6253	L12
6254	L12
6255	N10
6256	N11
6257	N10
6258	N11
6259	I14
6260	N 8
6261	P 9
6262	J15
6263	K15
6264	P 8
6265	J15
6266	J15
6352	F28
6504	B21
6505	B23
6507	K25
6508	K28
7250	M14
7252	J13
7253	L13
7254	M12
7255	L11
7256	J14
7257	N 9
7318	G28
7319	G27
7320	H30
7350	C26
7501	F 6
7502	D 4
7503	K 4
7504	K 5
7505	D 5
7506	C 7
7513	C22
7514	F22
7521	K26
7522	K27
7523	L26
7524	L27
7525	L25
7526	L27
7529	D19
7530	G19
7571	C19
7572	D21
7575	C16
7576	E16
7577	D 9
7578	H 9
7581	C11
7582	I12
7583	F12
7630	L19
7631	J19
7632	L23
7633	J23
7634	N21
7635	N22
7637	D 8
9580	A 3
9581	B 4

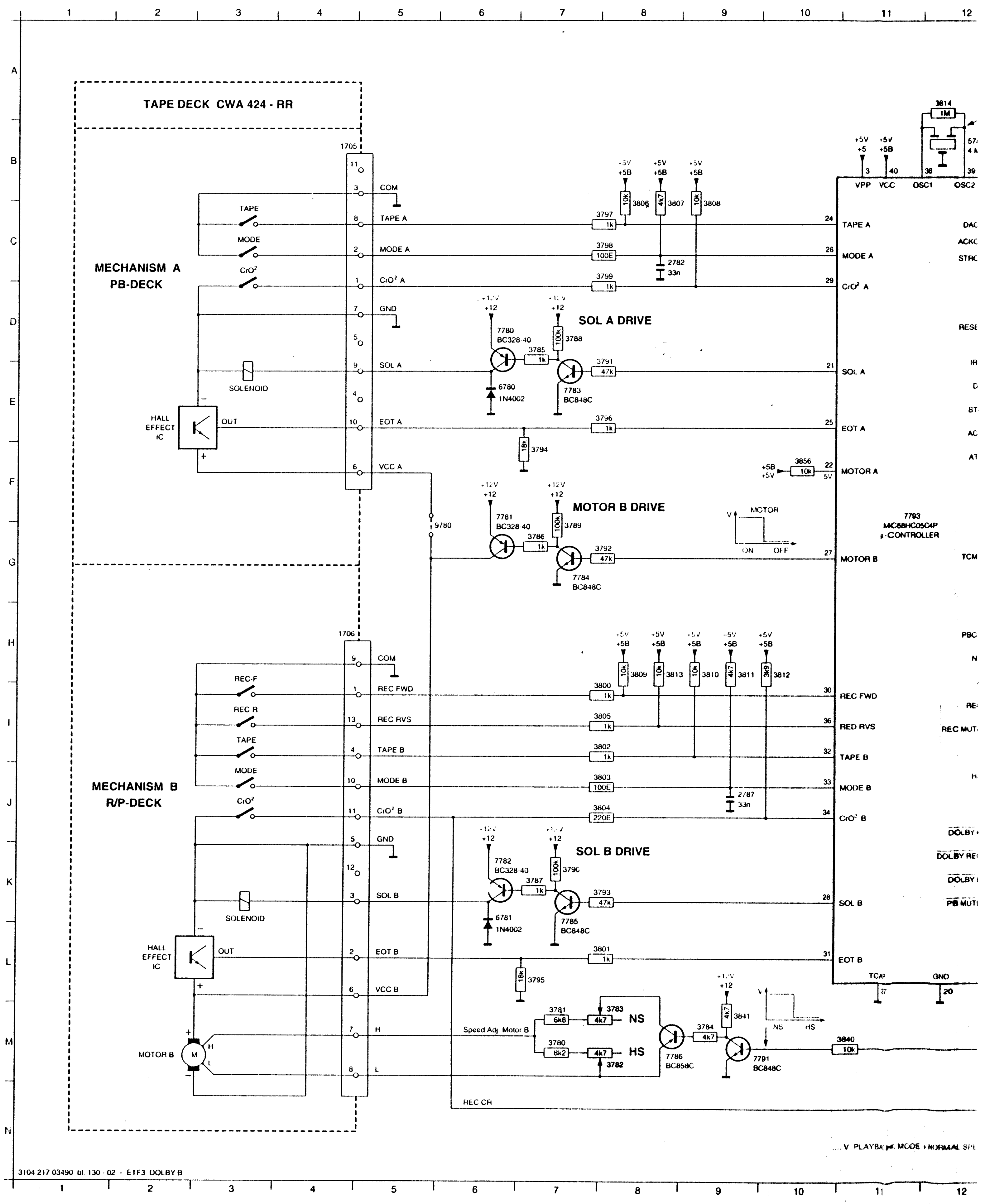
EXPLANATION OF ABBREVIATIONS

A	Deck A or B
CRO2	Chrome
Dolby NR	Dolby Noise Reduction
Dolby Mode	Dolby Mode (Rec or Play)
DSA STR	DSA Strobe
DSA DA	DSA Data
DSA ACK	DSA Acknowledge
EOT A	End of Tape A
EOT B	End of Tape B
FE	Ferro
HS	High Speed
MODE A	Slide Deck A Up / Down
MODE B	Slide Deck B Up / Down
NC	Not Connect
NS	Normal Speed
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ L	Playback Lever Adjustment Left
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ R	Playback Lever Adjustment Right
PBL	Playback Left
PBR	Playback Right
Rec Mute	Recording Mute
Rec R	Recording Right
Rec L	Recording Left
Rec CR	Recording Chrome
REC RVS	Recording Reverse
REC	Recording
REC FWD	Recording Forward
SOL A	Solenoid A
SOL B	Solenoid B
VCC B	VCC Motor B

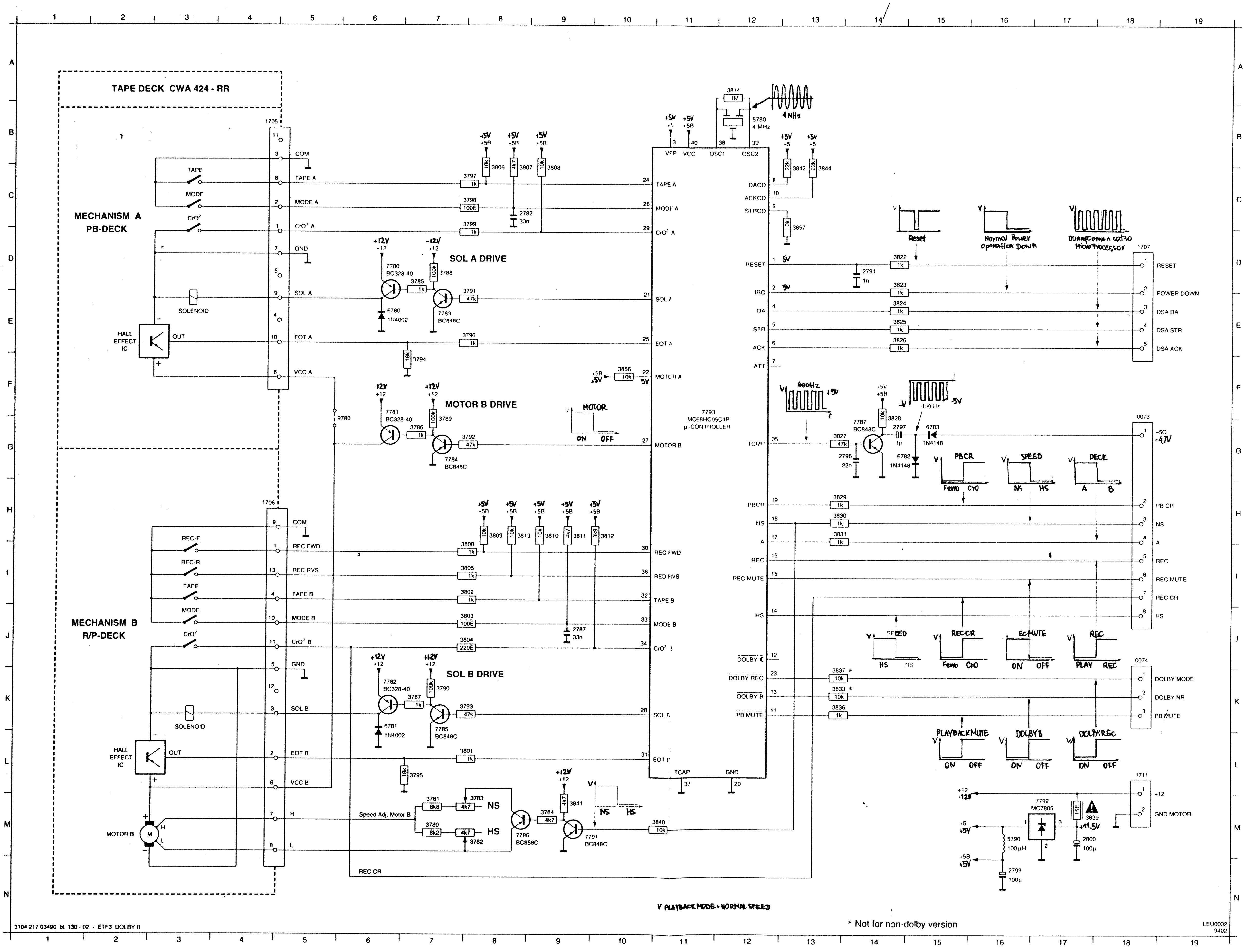
µProcessor 7793 pinning , values , In- Output Port

Pin	Discription	I/O PORT	Values
1	Reset	I	Must be driven by external reset circuitry
2	IRQ	I	0 = Power down 1 = normal operation
3	VPP	-	+5V
4	Date	I/O	DSA bus data line
5	Strobe	I/O	DSA bus clock line
6	Acknowledge	I/O	DSA bus acknowledge line
7	Attenuate	O	0 = Off 1 = On
8	DSA CD Data	I/O	DSA CD bus data line
9	DSA CD Strobe	I/O	DSA Bus strobe line
10	DSA CD Acknowledge	I/O	DSA CD bus Acknowledge line
11	Playback Mute	O	0 = Playback mute On
12	Dolby C	O	1 = Dolby C Off 0 = Dolby C On
13	Dolby B	O	1 = Dolby B Off 0 = Dolby B On
14	High Speed	O	0 = Normal speed 1 = High speed
15	Record Mute	O	1 = Record mute On
16	Play / Record	O	0 = Play 1 = Record
17	Playback A/B	O	1 = Deck A 0 = Deck B
18	Normal Speed	O	0 = High speed 1 = Normal speed
19	Playback Fe/CrO2	O	0 = Ferro 1 = CrO2
20	GND	-	Ground
21	Solenoid Deck A	O	Solenoid Deck A
22	Motor deck A	O	Not used
23	Dolby Record	O	0 = Record 1 = Play
24	Tape Detect Deck A	I	0 = Tape present in deck A
25	Halle IC Deck A	I	4 Pulses per rotation of winding wheel
26	Mode Deck A	I	0 = Slide up 1 = Slide down
27	Main Motor	O	Motor B
28	Solenoid Deck B	O	Solenoid Deck B
29	CrO2 Deck A	I	0 = Ferro Tape 1 = CrO2
30	Record Frontside Deck B	I	0 = Record enabled on frontside
31	Hall IC Deck B	I	4 Pulses per rotation of winding wheel
32	Tape Detect Deck B	I	0 = Tape present in deck B
33	Mode Deck B	I	0 = Slide up 1 = Slide down
34	CrO2 Deck B	I	0 = Ferro Tape 1 = CrO2
35	TCMP	O	400 Hz oscillator
36	Record Rearside Deck B	I	0 = Record enable on rearside
37	TCAP	I	Not used
38	OSC 1	-	4 MHz
39	OSC 2	-	4 MHz
40	VCC	-	+5V

ETF3 CONTROL PART (DOLBY B & NON-DOLBY)


TAPE DECK CWA 424 - RR
MECHANISM A PB-DECK
MECHANISM B R/P-DECK
1705
1706
COM
TAPE A
MODE A
CrO² A
GND
SOL A
EOT A
VCC A
SOLENOID
HALL EFFECT IC
OUT
SOL A DRIVE
MOTOR B DRIVE
SOL B DRIVE
REC FWD
REC RVS
TAPE B
MODE B
CrO² B
SOL B
EOT B
VCC B
MOTOR B
Speed Adj. Motor B
NS
HS
REC CR
7793 MC68HC05C4P µ-CONTROLLER
VPP
VCC
OSC1
OSC2
MOTOR A
MOTOR B
TCAP
GND
7780 BC328-40
7781 BC328-40
7782 BC328-40
7783 BC848C
7784 BC848C
7785 BC848C
7786 BC858C
7791 BC848C
6780 1N4002
6781 1N4002
9780
3104 217 03490 bl 130 - 02 - ETF3 DOLBY B

ETF3 CONTROL PART (DOLBY B & NON-DOLBY)


TAPE DECK CWA 424 - RR
MECHANISM A
PB-DECK
MECHANISM B
R/P-DECK
TAPE
MODE
CrO²
SOLENOID
HALL EFFECT IC
OUT
MOTOR B
1705
1706
COM
TAPE A
MODE A
CrO² A
GND
SOL A
EOT A
VCC A
REC FWD
REC RVS
TAPE B
MODE B
CrO² B
SOL B
EOT B
VCC B
SOL A DRIVE
MOTOR B DRIVE
SOL B DRIVE
7780 BC328-40
7781 BC328-40
7782 BC328-40
7783 BC848C
7784 BC848C
7785 BC848C
7786 BC858C
7791 BC848C
6780 1N4002
6781 1N4002
+12V
-12V
+5V
Speed Adj. Motor B
NS
HS
REC CR
7793
MC68HC05C4P
µ-CONTROLLER
VFP
VCC
OSC1
OSC2
5780 4 MHz
4MHz
TAPE A
MODE A
CrO² A
SOL A
EOT A
MOTOR A
MOTOR B
REC FWD
RED RVS
TAPE B
MODE B
CrO² B
SOL B
EOT B
TCAP
GND
DACD
ACKCD
STRCD
RESET
IRQ
DA
STR
ACK
ATT
TCMP
PBCR
NS
A
REC
REC MUTE
HS
DOLBY C
DOLBY REC
DOLBY B
PB MUTE
Reset
Normal Power Operation Down
During Communication to Micro Processor
1707
RESET
POWER DOWN
DSA DA
DSA STR
DSA ACK
400Hz
7787 BC848C
6782 1N4148
6783 1N4148
0073
-5C
-47V
PBCR
Ferro CrO
SPEED
NS HS
DECK
A B
PB CR
REC CR
SPEED
HS NS
RECCR
Ferro CrO
REC MUTE
ON OFF
REC
PLAY REC
0074
DOLBY MODE
DOLBY NR
PB MUTE
PLAYBACK MUTE
DOLBY B
DOLBY REC
ON OFF
MOTOR
ON OFF
1711
+12
GND MOTOR
7792
MC7805
5790 100µH
2799 100µ
2800 100µ
3839
V PLAYBACK MODE + NORMAL SPEED

* Not for non-dolby version

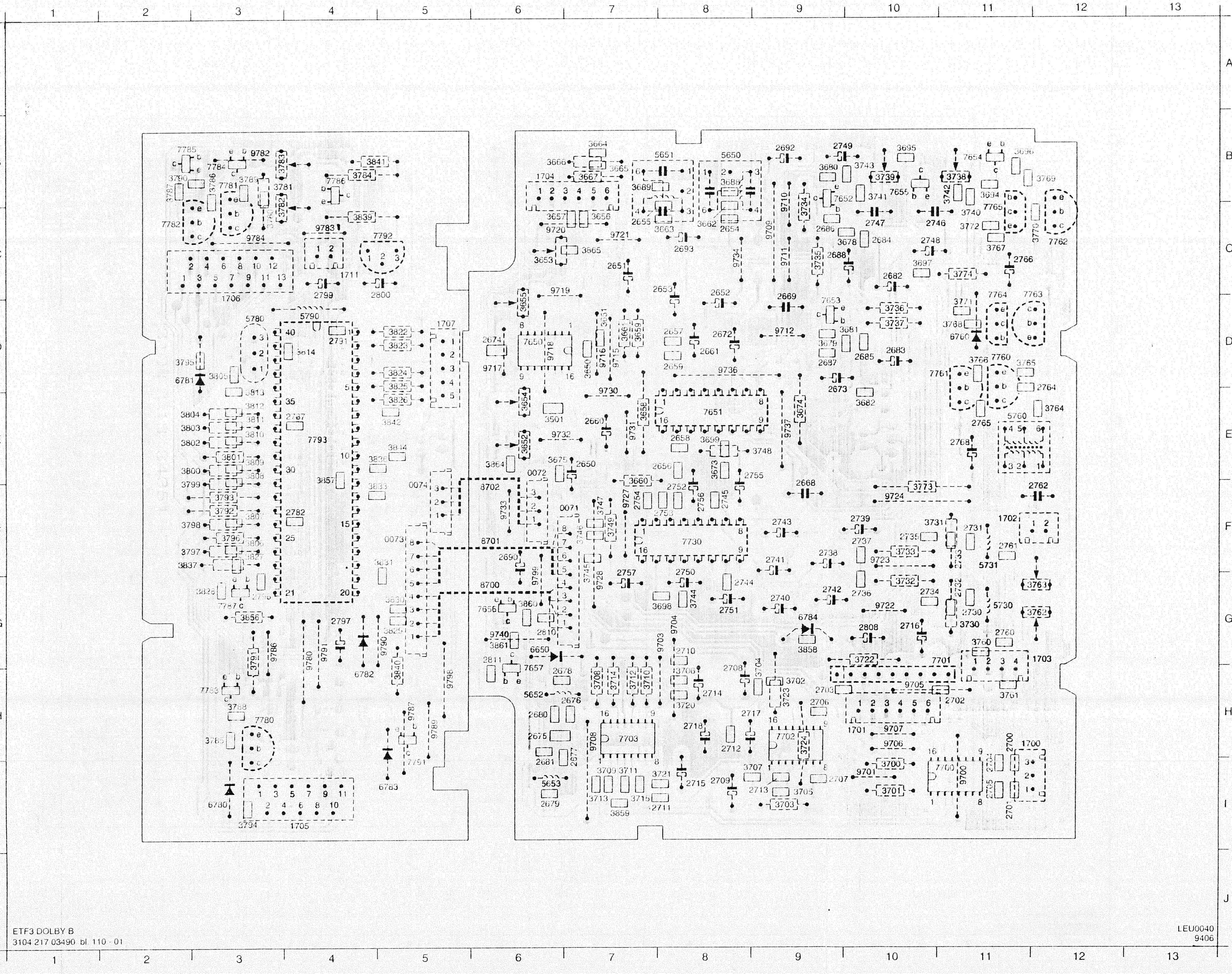
3104 217 03490 bl. 130 - 02 - ETF3 DOLBY B

LEU0032
9402

0073	F18
0074	J18
1705	B4
1706	H4
1707	D18
1711	L18
2782	C8
2787	J9
2791	D14
2796	G13
2797	G14
2799	N16
2800	M17
3780	M7
3781	M7
3782	M8
3783	M8
3784	M9
3785	D7
3786	G7
3787	K7
3788	D7
3789	G7
3790	K7
3791	E7
3792	G7
3793	K7
3794	F7
3795	L7
3796	E7
3797	C7
3798	C7
3799	C7
3800	I7
3801	L7
3802	I7
3803	J7
3804	J7
3805	I7
3806	C8
3807	C8
3808	C9
3809	H8
3810	H9
3811	H9
3812	H10
3813	H8
3814	A12
3822	D14
3823	D14
3824	E14
3825	E14
3826	E14
3827	G13
3828	G14
3829	H13
3830	H13
3831	H13
3833	K13
3836	K13
3837	K13
3839	M17
3840	M10
3841	M9
3842	C13
3844	C13
3856	F10
3857	D13
5780	B12
5790	M16
6780	E6
6781	K6
6782	G14
6783	G15
7780	D6
7781	F6
7782	K6
7783	E7
7784	G7
7785	L7
7786	M8
7787	G14
7791	M9
7792	M17
7793	F11
9780	G5

ETF3 DOLBY B (for all versions except /21)

0071	F6	2657	D8	2685	D10	2713	I8	2744	G8	2768	E11	3658	E7	3694	B11	3714	H7	3743	B10	3773	F10	3798	F2	3825	D5	3861	G6	7651	E8	7782	C2	9709	C9	9734	C8
0072	E6	2658	E8	2686	C9	2714	H8	2745	F8	2782	F4	3659	D7	3695	B10	3715	I7	3744	G8	3774	C11	3799	F2	3826	E5	3864	E6	7652	B9	7783	H3	9710	C9	9736	D8
0073	F5	2659	D8	2687	D9	2715	I8	2746	C10	2787	E4	3660	F7	3696	B11	3720	H8	3745	G7	3780	C3	3800	E2	3827	F3	3865	C7	7653	D9	7784	B3	9711	C9	9737	E9
0074	F5	2660	E7	2688	C9	2716	G10	2747	C10	2791	D4	3661	D7	3697	C10	3721	I7	3746	F7	3781	B3	3801	E3	3828	G3	5650	B8	7654	B11	7785	B2	9712	D9	9740	G6
1700	H11	2661	D8	2690	F6	2717	H8	2748	C10	2796	G3	3662	C8	3698	G7	3722	G10	3747	F7	3782	C4	3802	E2	3829	G5	5651	B7	7655	B10	7786	B4	9715	D7	9780	H4
1701	H10	2668	F9	2692	B9	2718	H8	2749	B9	2797	G4	3663	C7	3699	E8	3723	H9	3748	E9	3783	B4	3803	E2	3830	G5	5652	H6	7656	G6	7787	G3	9716	D7	9782	B3
1702	F11	2669	D9	2693	C8	2730	G11	2750	G8	2799	D4	3664	B7	3700	I10	3724	H9	3749	F7	3784	B4	3804	E2	3831	F4	5653	I6	7657	H6	7791	I5	9717	D6	9783	C4
1703	G12	2672	D8	2700	H11	2731	F11	2751	G8	2800	D4	3665	B7	3701	I10	3730	G11	3760	G11	3785	H3	3805	D3	3833	F4	5730	G11	7700	I10	7792	C4	9718	D6	9784	C3
1704	B6	2673	E9	2701	I11	2732	G11	2752	F8	2808	G10	3666	B6	3702	H9	3731	F10	3761	H11	3786	B3	3806	F3	3836	E4	5731	F11	7701	G10	7793	E4	9719	C6	9786	G3
1705	I4	2674	D6	2702	H11	2733	F11	2753	F7	2810	G6	3667	B7	3703	I9	3732	G10	3762	G11	3787	B2	3807	F3	3837	F2	5760	E11	7702	H9	8700	G6	9720	C6	9787	H5
1706	D3	2675	H6	2703	H9	2734	G10	2754	F7	2811	G6	3673	E8	3704	H9	3733	F10	3763	G11	3788	H3	3808	E3	3839	C4	5780	D3	7703	H7	8701	F6	9721	C7	9789	H5
1707	D5	2676	H6	2704	I11	2735	F10	2755	E8	3501	E6	3674	E9	3705	I9	3734	C9	3764	E12	3789	B3	3809	E3	3840	H5	5790	D4	7730	F8	8702	F6	9722	G10	9790	G5
1711	C4	2677	I7	2705	I11	2736	G10	2756	F8	3650	D7	3675	E6	3706	H8	3735	C9	3765	D11	3790	B2	3810	E3	3841	B4	6650	G6	7760	D11	9700	I11	9723	F10	9791	G4
2650	E7	2678	H6	2706	H9	2737	F10	2757	G7	3651	D7	3678	C9	3707	I8	3736	D10	3766	D11	3791	H3	3811	E3	3842	E5	6760	D11	7761	D10	9701	I10	9724	F10	9798	H5
2651	C7	2679	I6	2707	I9	2738	F9	2760	G11	3652	E6	3679	D9	3708	H7	3737	D10	3767	C11	3792	F3	3812	E3	3844	E5	6780	I3	7762	C12	9703	G8	9727	F7	9799	G6
2652	C8	2680	H6	2708	H8	2739	F10	2761	F11	3653	C6	3680	B9	3709	I7	3738	B11	3768	D11	3793	F3	3813	E3	3856	G3	6781	D2	7763	D11	9704	G8	9728	G7		
2653	C7	2681	I6	2709	I8	2740	G9	2762	F11	3654	E6	3681	D9	3710	H7	3739	B10	3769	B12	3794	I3	3814	D4	3857	F4	6782	H4	7764	D11	9705	H10	9730	E7		
2654	C8	2682	C10	2710	G8	2741	F9	2764	E12	3655	D6	3682	E10	3711	I7	3740	C11	3770	C12	3795	D2	3822	D5	3858	G9	6783	I5	7765	C11	9706	H10	9731	E7		
2655	C7	2683	D10	2711	I7	2742	G9	2765	E11	3656	C7	3688	B8	3712	H7	3741	B10	3771	D11	3796	F3	3823	D5	3859	I7	6784	G9	7780	H3	9707	H10	9732	E6		
2656	E7	2684	C10	2712	H8	2743	F9	2766	C11	3657	C6	3689	B7	3713	I7	3742	C11	3772	C11	3797	F2	3824	D5	3860	G6	7650	D6	7781	B3	9708	H7	9733	F6		



ETF3 DOLBY B
3104 217 03490 bl. 110 - 01

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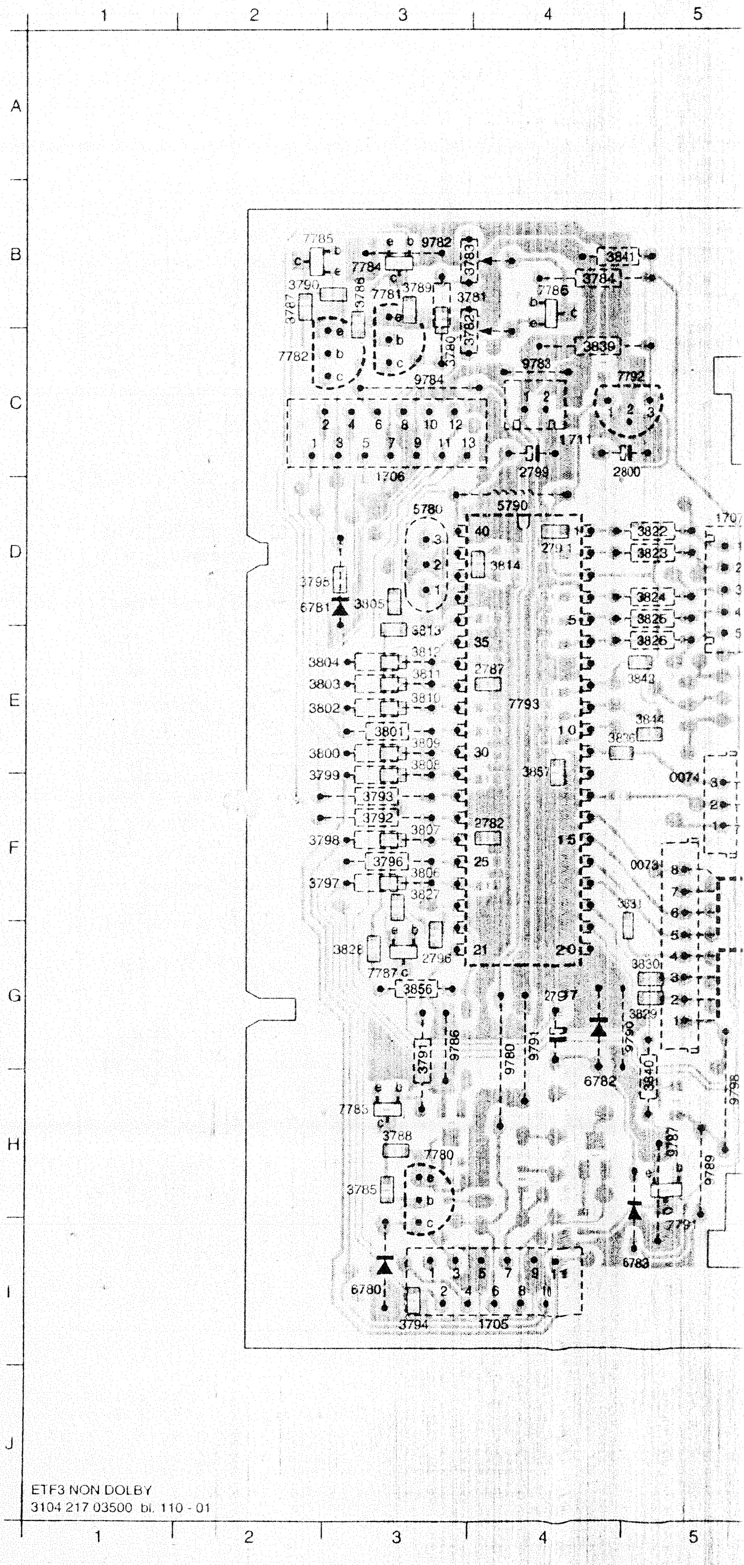
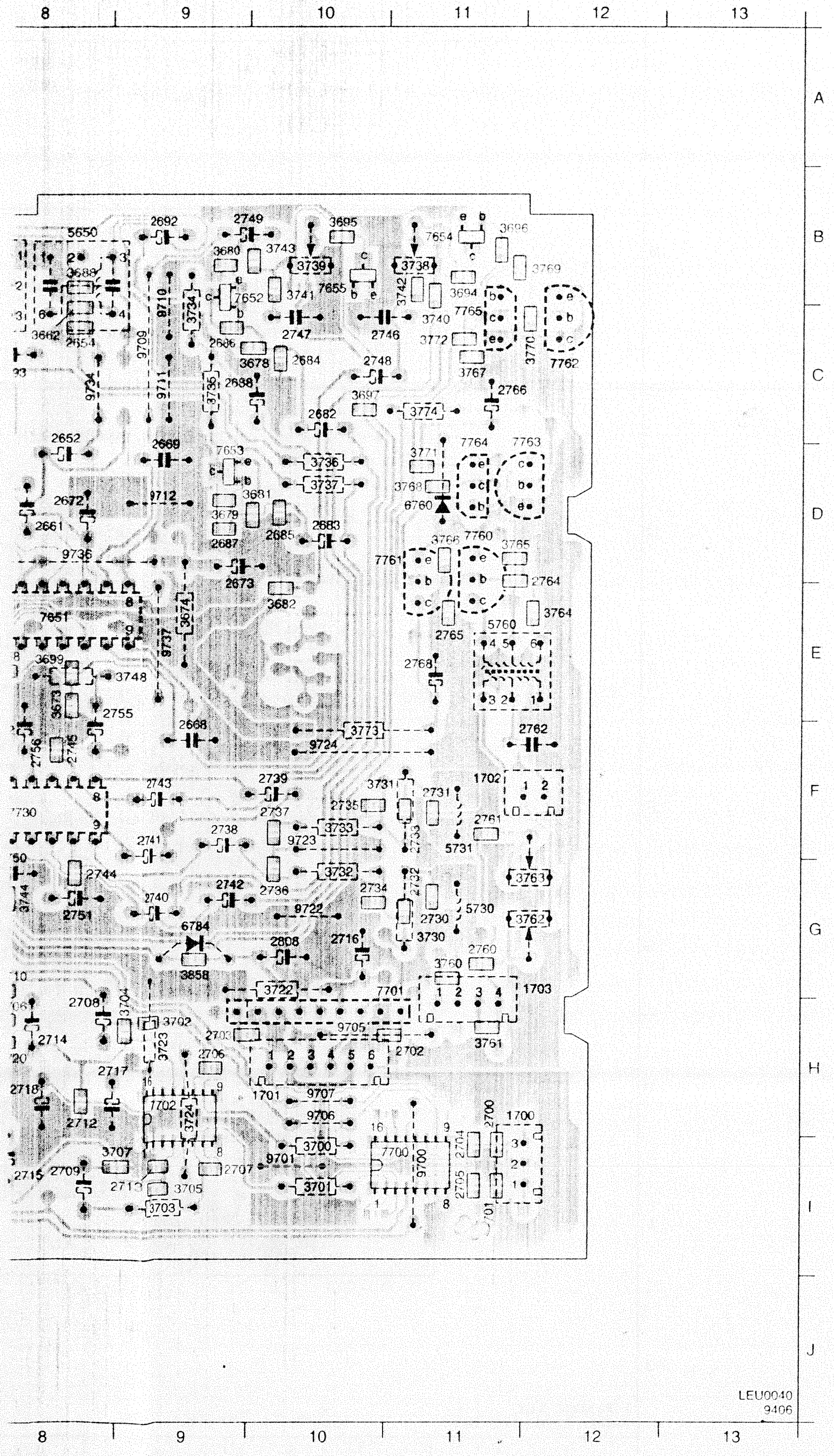
ETF3 NON-DOLBY (For /21 only)

0071	F6	2679	I6	2706	H9	2735	F10	2753	F7	2800	D4	3686	E6
0072	E6	2680	H6	2707	I9	2736	G10	2754	F7	2808	G10	3687	C6
0073	F5	2681	I6	2708	H8	2737	F10	2755	E8	2810	G6	3694	B11
0074	F5	2682	C10	2709	I8	2738	F9	2756	F8	2811	G6	3695	B10
1700	H11	2683	D10	2710	G8	2739	F10	2757	G7	3656	C7	3696	B11
1701	H10	2684	C10	2711	I7	2740	G9	2760	G11	3657	C6	3697	C10
1702	F11	2685	D10	2712	H8	2741	F9	2761	F11	3664	B7	3698	G7
1703	G12	2686	C9	2713	I8	2742	G9	2762	F11	3665	B7	3700	I10
1704	B6	2687	D9	2714	H8	2743	F9	2764	E12	3666	B6	3701	I10
1705	I4	2688	C9	2715	I8	2744	G8	2765	E11	3667	B7	3702	H9
1706	D3	2692	B9	2716	G10	2745	F8	2766	C11	3675	E6	3703	I9
1707	D5	2693	C8	2717	H8	2746	C10	2768	E11	3678	C9	3704	H9
1711	C4	2700	H11	2718	H8	2747	C10	2782	F4	3679	D9	3705	I9
2674	D6	2701	I11	2730	G11	2748	C10	2787	E4	3680	B9	3706	H8
2675	H6	2702	H11	2731	F11	2749	B9	2791	D4	3681	D9	3707	I8
2676	H6	2703	H9	2732	G11	2750	G8	2796	G3	3682	E10	3708	H7
2677	I7	2704	I11	2733	F11	2751	G8	2797	G4	3684	E6	3709	I7
2678	H6	2705	I11	2734	G10	2752	F8	2799	D4	3685	C6	3710	H7



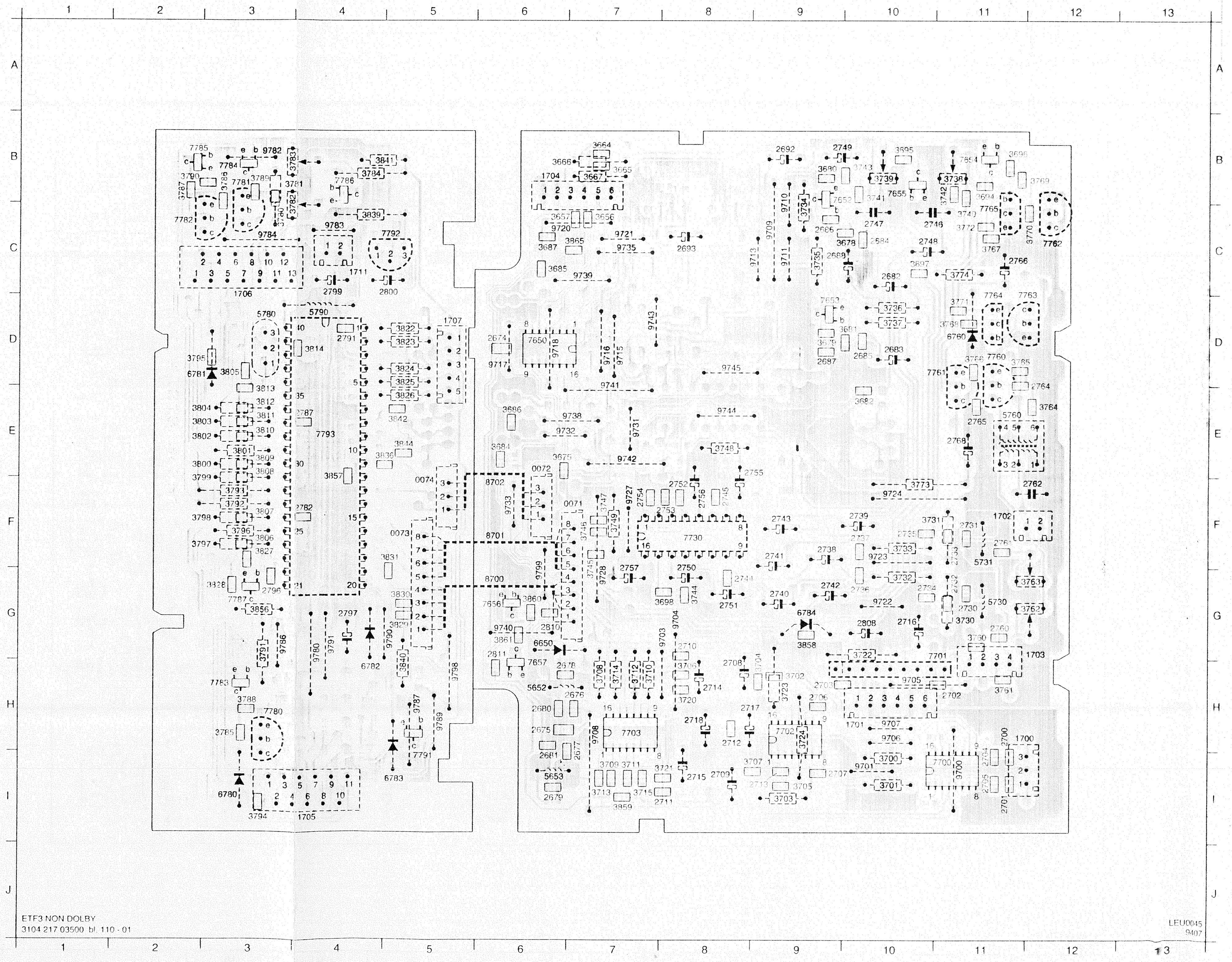
ETF3 NON DOLBY
3104 217 03500 bl. 110 - 01

F10	3798	F2	3825	D5	3861	G6	7651	E8	7782	C2	9709	C9	9734	C8		
C11	3799	F2	3826	E5	3864	E6	7652	B9	7783	H3	9710	C9	9736	D8		
C3	3800	E2	3827	F3	3865	C7	7653	D9	7784	B3	9711	C9	9737	E9		
B3	3801	E3	3828	G3	5650	B8	7654	B11	7785	B2	9712	D9	9740	G6		
C4	3802	E2	3829	G5	5651	B7	7655	B10	7786	B4	9715	D7	9780	H4		
B4	3803	E2	3830	G5	5652	H6	7656	G6	7787	G3	9716	D7	9782	B3		
B4	3804	E2	3831	F4	5653	I6	7657	H6	7791	I5	9717	D6	9783	C4		
H3	3805	D3	3833	F4	5730	G11	7700	I10	7792	C4	9718	D6	9784	C3		
B3	3806	F3	3836	E4	5731	F11	7701	G10	7793	E4	9719	C6	9786	G3		
B2	3807	F3	3837	F2	5760	E11	7702	H9	8700	G6	9720	C6	9787	H5		
H3	3808	E3	3839	C4	5780	D3	7703	H7	8701	F6	9721	C7	9789	H5		
B3	3809	E3	3840	H5	5790	D4	7730	F8	8702	F6	9722	G10	9790	G5		
B2	3810	E3	3841	B4	6650	G6	7760	D11	9700	I11	9723	F10	9791	G4		
H3	3811	E3	3842	E5	6760	D11	7761	D10	9701	I10	9724	F10	9798	H5		
F3	3812	E3	3844	E5	6780	I3	7762	C12	9703	G8	9727	F7	9799	G6		
F3	3813	E3	3856	G3	6781	D2	7763	D11	9704	G8	9728	G7				
I3	3814	D4	3857	F4	6782	H4	7764	D11	9705	H10	9730	E7				
D2	3822	D5	3858	G9	6783	I5	7765	C11	9706	H10	9731	E7				
F3	3823	D5	3859	I7	6784	G9	7780	H3	9707	H10	9732	E6				
F2	3824	D5	3860	G6	7650	D6	7781	B3	9708	H7	9733	F6				

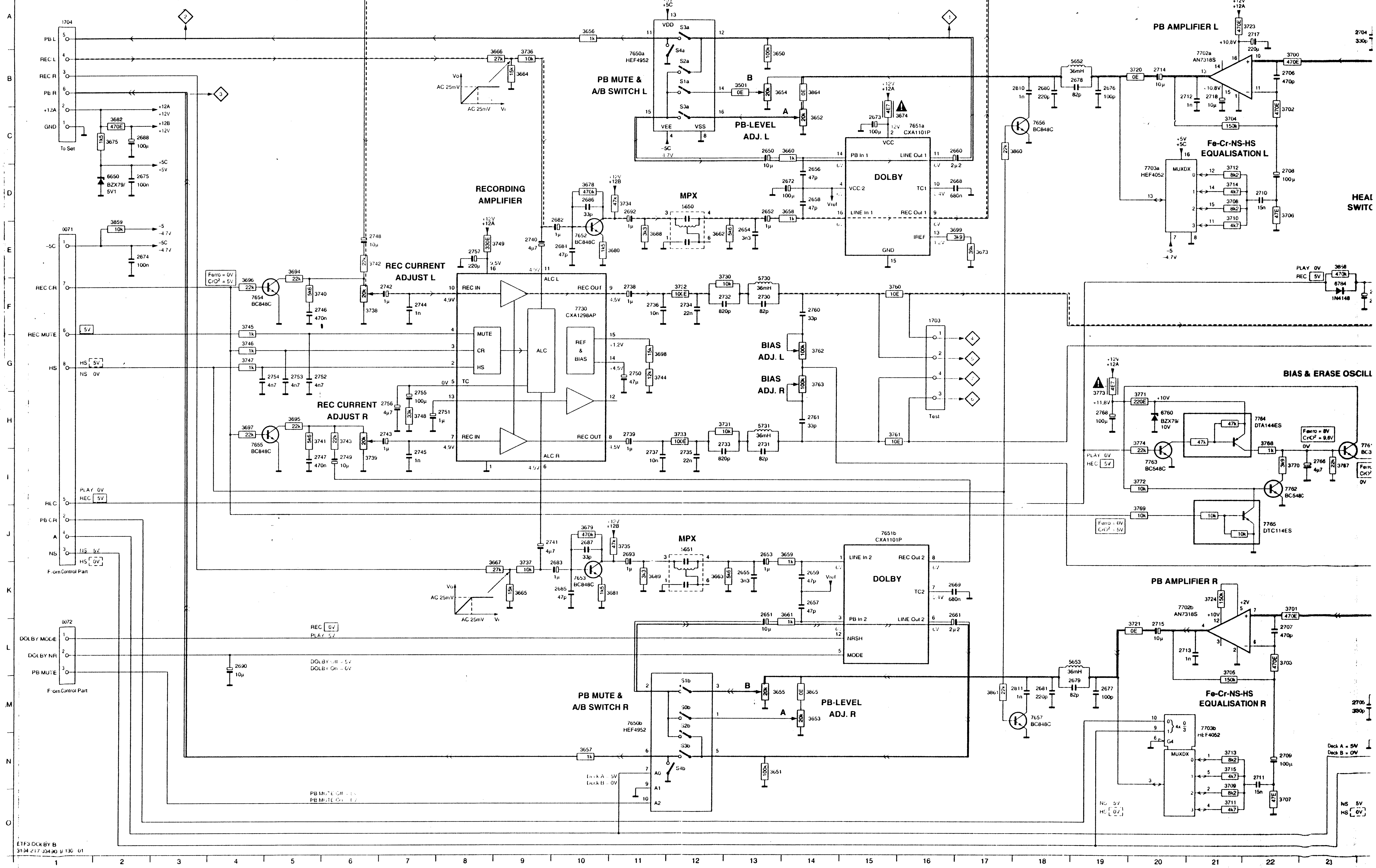


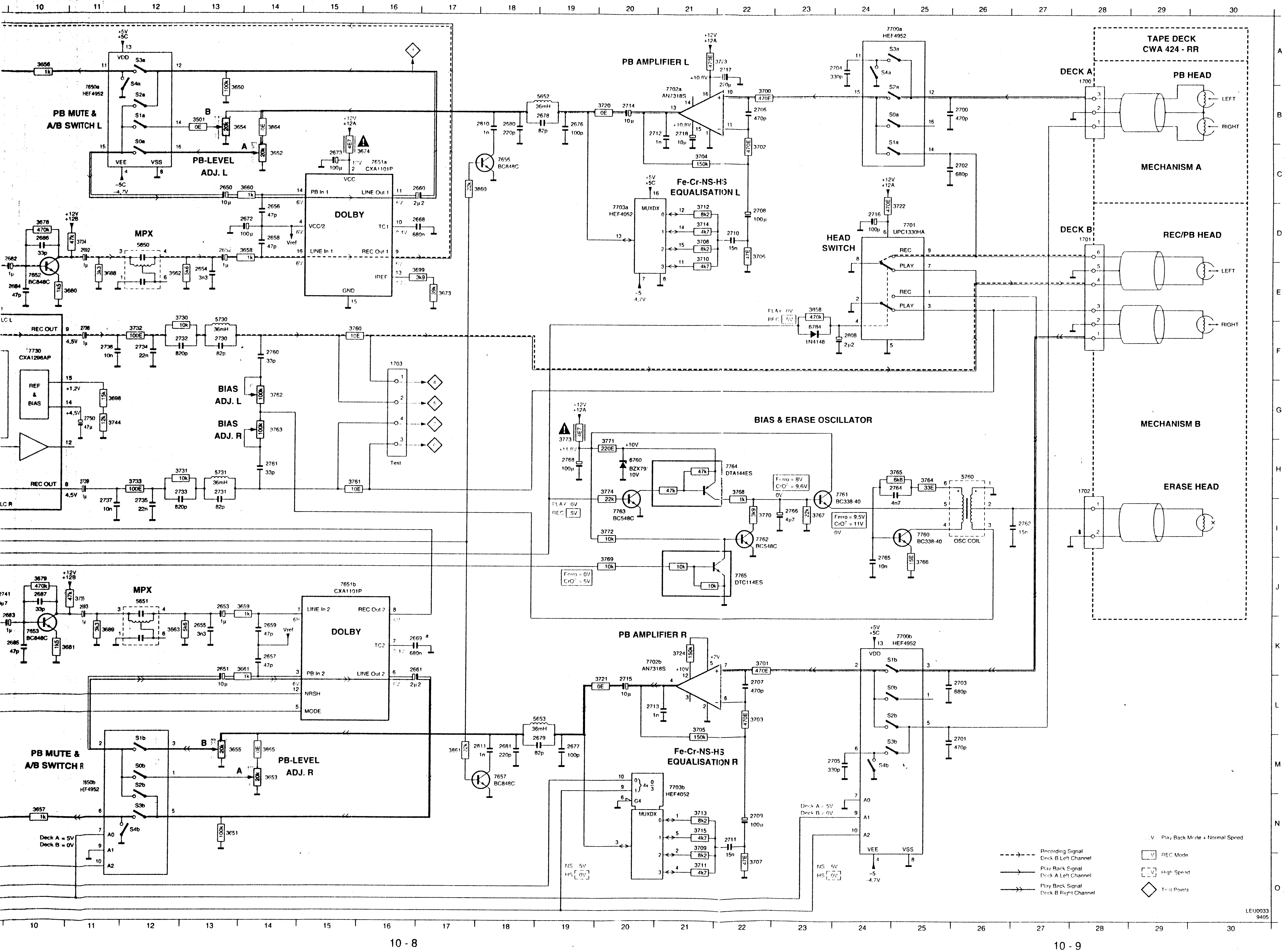
ETF3 NON-DOLBY (For /21 only)

0071	F6	2679	I6	2706	H9	2735	F10	2753	F7	2800	D4	3686	E6	3711	I7	3738	B11	3766	D11	3789	B3	3807	F3	3836	E4	5780	D3	7702	H9	7792	C4	9716	D7	9742	E7
0072	E6	2680	H6	2707	I9	2736	G10	2754	F7	2808	G10	3687	C6	3712	H7	3739	B10	3767	C11	3790	B2	3808	E3	3839	C4	5790	D4	7703	H7	7793	E4	9717	D6	9743	D7
0073	F5	2681	I6	2708	H8	2737	F10	2755	E8	2810	G6	3694	B11	3713	I7	3740	C11	3768	D11	3791	H3	3809	E3	3840	H5	6650	G6	7730	F8	8700	G6	9718	D6	9744	E8
0074	F5	2682	C10	2709	I8	2738	F9	2756	F8	2811	G6	3695	B10	3714	H7	3741	B10	3769	B12	3792	F3	3810	E3	3841	B4	6760	D11	7760	D11	8701	F6	9720	C6	9745	D8
1700	H11	2683	D10	2710	G8	2739	F10	2757	G7	3656	C7	3696	B11	3715	I7	3742	C11	3770	C12	3793	F3	3811	E3	3842	E5	6780	I3	7761	D10	8702	F6	9721	C7	9780	H4
1701	H10	2684	C10	2711	I7	2740	G9	2760	G11	3657	C6	3697	C10	3720	H8	3743	B10	3771	D11	3794	I3	3812	E3	3844	E5	6781	D2	7762	C12	9700	I11	9722	G10	9782	B3
1702	F11	2685	D10	2712	H8	2741	F9	2761	F11	3664	B7	3698	G7	3721	I7	3744	G8	3772	C11	3795	D2	3813	E3	3856	G3	6782	H4	7763	D11	9701	I10	9723	F10	9783	C4
1703	G12	2686	C9	2713	I8	2742	G9	2762	F11	3665	B7	3700	I10	3722	G10	3745	G7	3773	F10	3796	F3	3814	D4	3857	F4	6783	I5	7764	D11	9703	G8	9724	F10	9784	C3
1704	B6	2687	D9	2714	H8	2743	F9	2764	E12	3666	B6	3701	I10	3723	H9	3746	F7	3774	C11	3797	F2	3822	D5	3858	G9	6784	G9	7765	C11	9704	G8	9727	F7	9786	G3
1705	I4	2688	C9	2715	I8	2744	G8	2765	E11	3667	B7	3702	H9	3724	H9	3747	F7	3780	C3	3798	F2	3823	D5	3859	I7	7650	D6	7780	H3	9705	H10	9728	G7	9787	H5
1706	D3	2692	B9	2716	G10	2745	F8	2766	C11	3675	E6	3703	I9	3730	G11	3748	E8	3781	B3	3799	F2	3824	D5	3860	G6	7652	B9	7781	B3	9706	H10	9731	E7	9789	H5
1707	D5	2693	C8	2717	H8	2746	C10	2768	E11	3678	C9	3704	H9	3731	F10	3749	F7	3782	C4	3800	E2	3825	D5	3861	G6	7653	D9	7782	C2	9707	H10	9732	E6	9790	G5
1711	C4	2700	H11	2718	H8	2747	C10	2782	F4	3679	D9	3705	I9	3732	G10	3760	G11	3783	B4	3801	E3	3826	E5	3865	C6	7654	B11	7783	H3	9708	H7	9733	F6	9791	G4
2674	D6	2701	I11	2730	G11	2748	C10	2787	E4	3680	B9	3706	H8	3733	F10	3761	H11	3784	B4	3802	E2	3827	F3	5652	H6	7655	B10	7784	B3	9709	C9	9735	C7	9798	H5
2675	H6	2702	H11	2731	F11	2749	B9	2791	D4	3681	D9	3707	I8	3734	C9	3762	G11	3785	H3	3803	E2	3828	G3	5653	I6	7656	G6	7785	B2	9710	C9	9738	E6	9799	G6
2676	H6	2703	H9	2732	G11	2750	G8	2796	G3	3682	E10	3708	H7	3735	C9	3763	G11	3786	B3	3804	E2	3829	G5	5730	G11	7657	H6	7786	B4	9711	C9	9739	C7		
2677	I7	2704	I11	2733	F11	2751	G8	2797	G4	3684	E6	3709	I7	3736	D10	3764	E12	3787	B2	3805	D3	3830	G5	5731	F11	7700	I10	7787	G3	9713	C9	9740	G6		
2678	H6	2705	I11	2734	G10	2752	F8	2799	D4	3685	C6	3710	H7	3737	D10	3765	D11	3788	H3	3806	F3	3831	F4	5760	E11	7701	G10	7791	I5	9715	D7	9741	E7		



DOLBY B ANALOG PART (For all versions except /21)


1704
PB L
REC L
REC R
PB R
+12A
GND
To Set
0071
-5C
REC CR
REC MUTE
HS
REC
PB CR
A
NS
Front Control Part
0072
DOLBY MODE
DOLBY NR
PB MUTE
Front Control Part
Ferro = 0V
CrO2 = 5V
RECORDING AMPLIFIER
REC CURRENT ADJUST L
REC CURRENT ADJUST R
MPX
5650
5651
PB MUTE & A/B SWITCH L
PB MUTE & A/B SWITCH R
7650a HEF4952
7650b HEF4952
PB-LEVEL ADJ. L
PB-LEVEL ADJ. R
DOLBY
7651a CXA1101P
7651b CXA1101P
7730 CXA1298AP
REC IN
REC OUT
ALC L
ALC R
MUTE
CR
HS
ALC
REF & BIAS
TC
BIAS ADJ. L
BIAS ADJ. R
1703
Test
PB AMPLIFIER L
PB AMPLIFIER R
7702a AN7318S
7702b AN7318S
Fe-Cr-NS-HS EQUALISATION L
Fe-Cr-NS-HS EQUALISATION R
7703a HEF4052
7703b HEF4052
MUXDX
HEAD SWITC
BIAS & ERASE OSCILL
7764 DTA144ES
7765 DTC114ES
7763 BC548C
7762 BC548C
6760 BZX79/10V
6650 BZX79/5V1
6784 1N4148
PLAY 0V
REC 5V
Ferro = 8V
CrO2 = 9,6V
Deck A = 5V
Deck B = 0V
NS 5V
HS 0V
REC 0V
PLAY 5V
DOLBY Off = 5V
DOLBY On = 0V
PB MUTE Off = 5V
PB MUTE On = 0V
AC 25mV
LINE In 1
LINE In 2
PB In 1
PB In 2
LINE Out 1
LINE Out 2
REC Out 1
REC Out 2
NRSH
MODE
VCC
GND
IREF
Vref
TC1
TC2
VDD
VEE
VSS
S1a
S2a
S3a
S4a
S1b
S2b
S3b
S4b
S0b
A0
A1
A2
7652 BC848C
7653 BC848C
7654 BC848C
7655 BC848C
7656 BC848C
7657 BC848C
ETF3 DOLBY B
3104 217 03490 B 130 01


PB MUTE & A/B SWITCH L
PB-LEVEL ADJ. L
DOLBY
MPX
PB AMPLIFIER L
Fe-Cr-NS-HS EQUALISATION L
HEAD SWITCH
TAPE DECK CWA 424 - RR
DECK A
PB HEAD
LEFT
RIGHT
MECHANISM A
DECK B
REC/PB HEAD
BIAS ADJ. L
BIAS ADJ. R
BIAS & ERASE OSCILLATOR
MECHANISM B
ERASE HEAD
OSC COIL
Test
PB MUTE & A/B SWITCH R
PB-LEVEL ADJ. R
PB AMPLIFIER R
Fe-Cr-NS-HS EQUALISATION R
CXA1101P
CXA1296AP
HEF4952
AN7318S
HEF4052
UPC1330HA
Deck A = 5V
Deck B = 0V
Recording Signal Deck B Left Channel
Play Back Signal Deck A Left Channel
Play Back Signal Deck B Right Channel
V Play Back Mode + Normal Speed
V REC Mode
V High Speed
Test Points
LEU0033 9405

0071	E1	3681	K10
0072	L1	3682	C2
1700	A28	3688	E11
1701	D28	3689	K11
1702	H28	3694	E5
1703	F16	3695	H5
1704	A1	3696	F4
2650	C13	3697	H4
2651	K13	3698	G11
2652	D13	3699	E16
2653	J13	3700	B22
2654	E13	3701	K22
2655	K13	3702	C22
2656	D14	3703	L22
2657	K14	3704	C21
2658	D14	3705	L21
2659	K14	3706	D22
2660	C16	3707	O22
2661	K16	3708	D21
2668	D16	3709	N21
2669	K16	3710	D21
2672	D13	3711	O21
2673	C15	3712	D21
2674	E2	3713	N21
2675	D2	3714	D21
2676	B19	3715	N21
2677	M19	3720	B19
2678	B18	3721	L19
2679	M18	3722	D25
2680	B18	3723	A21
2681	M18	3724	K21
2682	E9	3730	F12
2683	K9	3731	H12
2684	E10	3732	F12
2685	K10	3733	H12
2686	D10	3734	D11
2687	J10	3735	J11
2688	C2	3736	B9
2690	L4	3737	K9
2692	D11	3738	F6
2693	J11	3739	I6
2700	B26	3740	F5
2701	M26	3741	H5
2702	C26	3742	E6
2703	L26	3743	H6
2704	A23	3744	G11
2705	M23	3745	F4
2706	B22	3746	G4
2707	L22	3747	G4
2708	D22	3748	H7
2709	N22	3749	E8
2710	D22	3760	F15
2711	N22	3761	H15
2712	B20	3762	G14
2713	L20	3763	G14
2714	B20	3764	H25
2715	L20	3765	H24
2716	D24	3766	J25
2717	A22	3767	I23
2718	B21	3768	H22
2730	F13	3769	J20
2731	H13	3770	I22
2732	F12	3771	H20
2733	H12	3772	I20
2734	F12	3773	H19
2735	I12	3774	H20
2736	F11	3858	E23
2737	I11	3859	E2
2738	F11	3860	C17
2739	H11	3861	M17
2740	E9	3864	B14
2741	J9	3865	M14
2742	F6	5650	D12
2743	H6	5651	J12
2744	F7	5652	B18
2745	I7	5653	L18
2746	F5	5730	F13
2747	I5	5731	H13
2748	E6	5760	H26
2749	I6	6650	D2
2750	G11	6760	H20
2751	H8	6784	F23
2752	G5	7650a	B11
2753	G5	7650b	M11
2754	G5	7651a	C16
2755	H7	7651b	J15
2756	H7	7652	E10
2757	E8	7653	K10
2760	F14	7654	F4
2761	H14	7655	H4
2762	I27	7656	C18
2764	H24	7657	M18
2765	J24	7700a	A24
2766	I23	7700b	K25
2768	H19	7701	D25
2808	F24	7702a	B21
2810	B17	7702b	K20
2811	M17	7703a	D20
3501	B13	7703b	M21
3650	B13	7730	F10
3651	N13	7760	I25
3652	C14	7761	H24
3653	M14	7762	I22
3654	B13	7763	I20
3655	M13	7764	H22
3656	A10	7765	J22
3657	N10	S0a	B24
3658	D13	S0b	L24
3659	J13	S1a	C24
3660	C13	S1b	K24
3661	K13	S2a	B24
3662	E12	S2b	L24
3663	K12	S3a	A24
3664	B9	S3b	M24
3665	K9	S4a	A24
3666	B8	S4b	M24
3667	K8		
3673	E17		
3674	C15		
3675	C2		
3678	D10		
3679	J10		
3680	E10		

EXPLANATION OF ABBREVIATIONS

A	Deck A or B
CRO2	Chrome
Dolby NR	Dolby Noise Reduction
Dolby Mode	Dolby Mode (Rec or Play)
DSA STR	DSA Strobe
DSA DA	DSA Data
DSA ACK	DSA Acknowledge
EOT A	End of Tape A
EOT B	End of Tape B
FE	Ferro
HS	High Speed
MODE A	Slide Deck A Up / Down
MODE B	Slide Deck B Up / Down
NC	Not Connect
NS	Normal Speed
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ L	Playback Lever Adjustment Left
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ R	Playback Lever Adjustment Right
PBL	Playback Left
PBR	Playback Right
Rec Mute	Recording Mute
Rec R	Recording Right
Rec L	Recording Left
Rec CR	Recording Chrome
REC RVS	Recording Reverse
REC	Recording
REC FWD	Recording Forward
SOL A	Solenoid A
SOL B	Solenoid B
VCC B	VCC Motor B

SERVICE SOLUTION for RIF INTERFERENCE

Re-adjust oscillator coil 5760 (half a turn)
so that the interference is gone.

ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

Adjustment	Cassette	Recorder in position	Measure on	Read on	Adjust with	Value	Remarks
Deck A High Speed HS	SBC419 3150Hz	High Speed dubbing	Test point TP 1	Counter	3782	5.4kHz ±0,5%	see #1
Deck A Norm.Speed NS	SBC419 3150Hz	Play in forward direction	Test point TP 2	Counter	3783	3,15 kHz ±0,5%	
Wow and Flutter	SBC419 3150Hz	Play in forward direction	Test point TP 2	Wow and Flutter meter	check	< 0,4%	
Deck A Playback DolbyLevel	Dolby 200 N.Wb/m	Play in forward direction	TP 2 left ch TP 3 right ch	AC mV meter	3652 3653	548mV ±0.5dB	see #2
Deck B Playback DolbyLevel	Dolby 200 N.Wb/m	Play in forward direction	TP 2 left ch TP 3 right ch	AC mV meter	3654 3655	548mV ±0.5dB	
Deck A Azimuth	SBC 419 12kHz	Play in forward direction	TP 2 left ch or TP 3 right ch	AC mV meter	Left screw Norm.Dir.(>)	max. output left=right	
		Play in reverce direction			Right screw Rev.Dir.(<)		
Deck B Azimuth	SBC 419 12kHz	Play in forward direction	TP 2 left ch or TP 3 right ch	AC mV meter	Left screw Norm.Dir.(>)	max. output left=right	
		Play in reverce direction			Right screw Rev.Dir.(<)		
Bias current Chrome	-	Record mode and Chrome mode	TP 4 5 L.ch	AC mV meter	3762	7 mV	see #3
			TP 6 7 R.ch		3763		
Bias current Ferro	-	Record mode and Ferro mode	TP 4 5 L.ch	AC mV meter	check	4,4mV ±0.5dB	
			TP 6 7 R.ch		check		
Recording current	Dolby 200N Wb/m (deck A) and Chrome.cass (deck B)	Record mode and Chrome mode	TP 4 5 L.ch	AC mV meter	3738	0,68mV	Filter out osc with audio filter see also #4
			TP 6 7 R.ch		3739	Rec/PB Level within ±1 dB of 548 mV	
	Dolby 200N Wb/m (deck A) and Ferro.cass (deck B)	Record mode and Ferro mode	TP 4 5 L.ch		check	0,45mV	
			TP 6 7 R.ch		check	Rec/PB Level within ±1 dB of 548 mV	
Multiplex Filter		Record mode Inject 19kHz at line in	TP 2 left ch. TP 3 right ch	AC mV meter	5650 5651	Min. output Typ. Attenuation >40dB Min. Attenuation >30dB	
Oscillator Frequency		Record mode	TP 4 5 L.ch	Counter	5760	88kHz ±6kHz	

#1 Motor must be aligned for HS before NS. H.S. ratio = 1,7

#2 Dolby level to be tested in reverse direction within same tolerance.

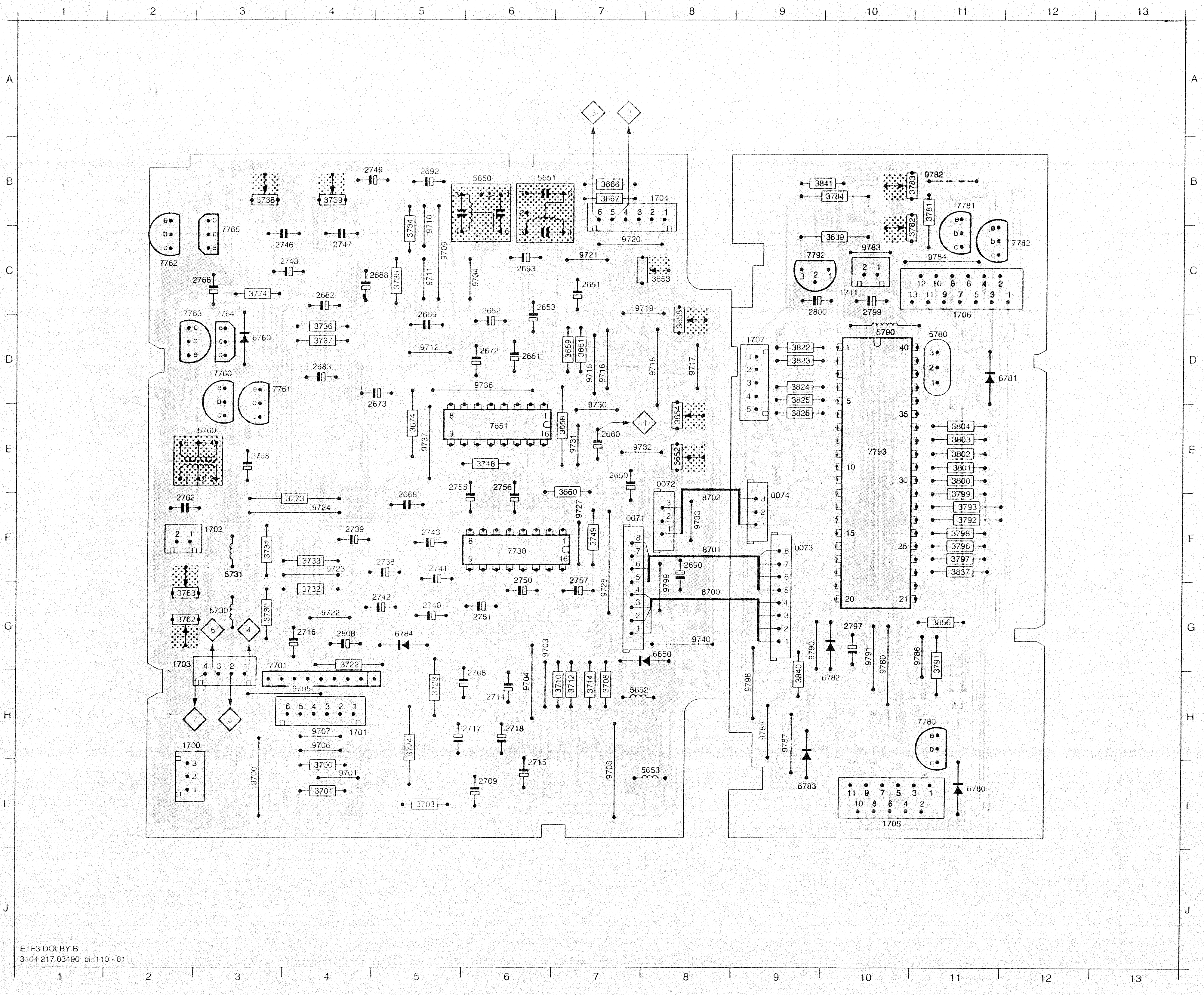
#3 Bias current must be aligned for Chrome position

#4 Recording current should be aligned using an iterative method. Perform a dubbing using test tape Dolby 200 N. Wb/m as source, and Ferro tape or Chrome tape as target blank tapes. Check that the output t.p. gives 548 mV during dubbing. Then playback the recorded tape. The record/playback level should also be 548 mV ± 0.5 dB. If not, adjust 3738 (L) and 3739 (R) accordingly.

ETF3 DOLBY B - COMPONENTS

0071	F7	1707	D9	2673	E4	2716	G4	2748	C3	2799	D10	3666	B7	3723	H5	3739	B4
0072	E8	1711	C10	2682	C4	2717	H6	2749	B4	2800	D9	3667	B7	3724	H5	3748	E6
0073	F9	2650	E7	2683	D4	2718	H6	2750	G6	2808	G4	3674	E5	3730	G3	3749	F7
0074	F9	2651	C7	2688	C4	2738	F5	2751	G6	3652	E8	3700	I4	3731	F3	3762	G2
1700	H2	2652	C6	2690	F8	2739	F4	2755	E5	3653	C8	3701	I4	3732	G4	3763	G2
1701	H4	2653	C6	2692	B5	2740	G5	2756	E6	3654	E8	3703	I5	3733	F4	3773	F4
1702	F3	2660	E7	2693	C6	2741	F5	2757	G7	3655	D8	3708	H7	3734	C5	3774	C3
1703	G2	2661	D6	2708	H6	2742	G4	2762	F2	3658	E7	3710	H7	3735	C5	3781	B11
1704	B8	2668	F5	2709	I6	2743	F5	2766	C2	3659	D7	3712	H7	3736	D4	3782	C11
1705	I10	2669	D5	2714	H6	2746	C3	2768	E3	3660	F7	3714	H7	3737	D4	3783	B11
1706	D11	2672	D6	2715	I6	2747	C4	2797	G10	3661	D7	3722	G4	3738	B3	3784	B10

3791	H11	3804	E11	5650	B6	6780	I11	7763	D2	9700	I3	9712	D5	9727	F7	9782	B11
3792	F11	3822	D9	5651	B6	6781	D11	7764	D3	9701	I4	9715	D7	9728	G7	9783	C10
3793	F11	3823	D9	5652	H7	6782	H9	7765	C3	9703	G6	9716	D7	9730	E7	9784	C11
3796	F11	3824	D9	5653	I7	6783	I9	7780	H11	9704	H6	9717	D8	9731	E7	9786	G11
3797	F11	3825	D9	5730	G3	6784	G5	7781	B11	9705	H4	9718	D8	9732	E7	9787	H9
3798	F11	3826	E9	5731	F3	7651	E6	7782	C12	9706	H4	9719	C7	9733	F8	9789	H9
3799	F11	3837	F11	5760	E3	7701	G3	7792	C9	9707	H4	9720	C7	9734	C6	9790	G9
3800	E11	3839	C10	5780	D11	7730	F6	7793	E10	9708	I7	9721	C7	9736	D6	9791	G10
3801	E11	3840	H9	5790	D10	7760	D3	8700	G8	9709	C5	9722	G4	9737	E5	9798	H9
3802	E11	3841	B9	6650	G8	7761	D3	8701	F8	9710	C5	9723	F4	9740	G8	9799	G8
3803	E11	3856	G11	6760	D3	7762	C2	8702	F8	9711	C5	9724	F4	9780	H10		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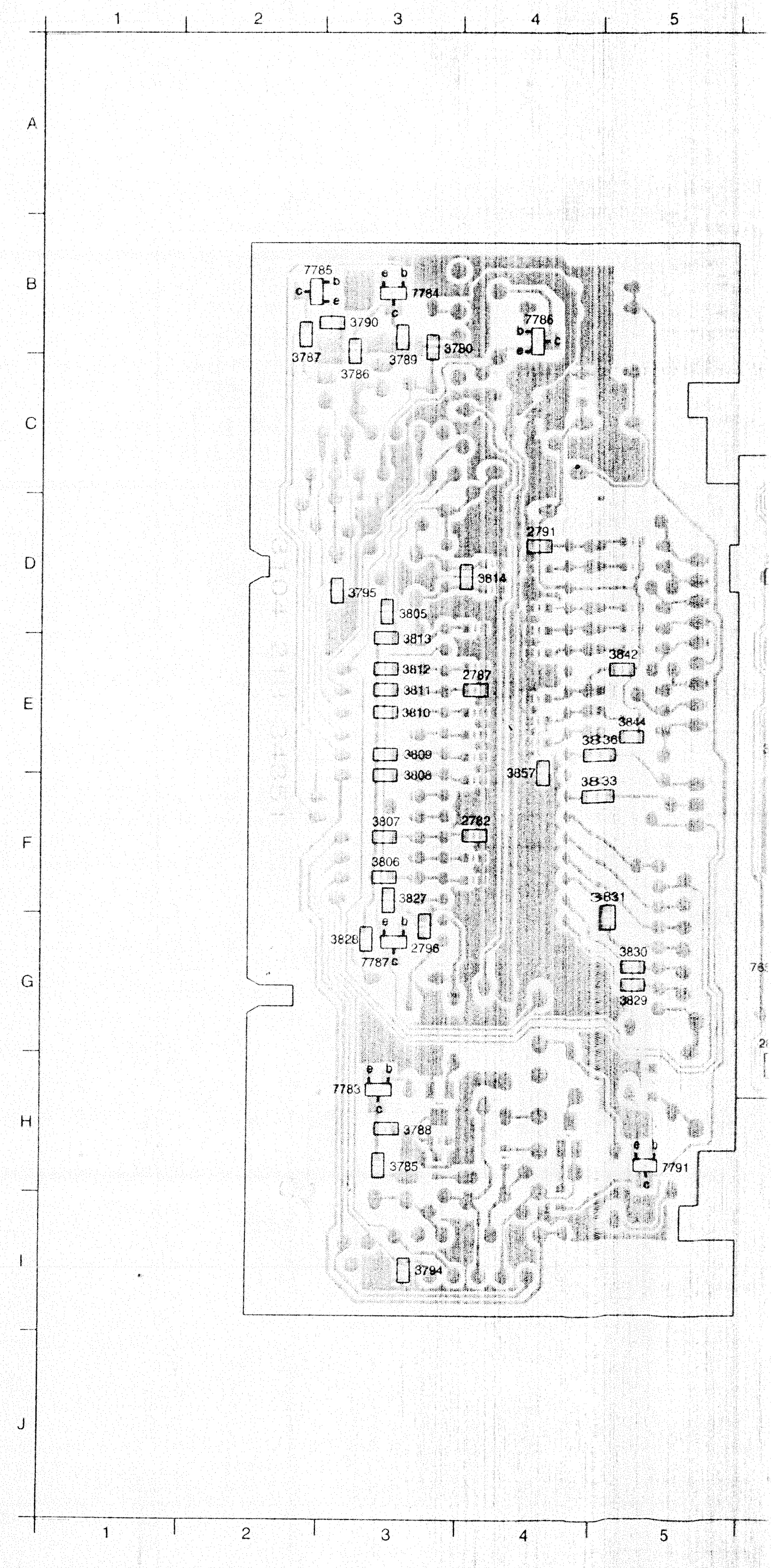
ETF3 DOLBY B
3104 217 03490 bl 110 - 01

ETF3 DOLBY B - CHIPS

2654	C8	2677	I7	2700	I11	2711	I7	2736	G10	2764	E12	3650	D7	3675
2655	C8	2678	H6	2701	I11	2712	H8	2737	F10	2765	E11	3651	D7	3678
2656	E8	2679	I6	2702	H10	2713	I8	2744	G8	2782	F4	3656	C7	3679
2657	D8	2680	H6	2703	H9	2730	G11	2745	F8	2787	E4	3657	C6	3680
2658	E8	2681	I6	2704	H11	2731	F11	2752	F8	2791	D4	3662	C8	3681
2659	D8	2684	C10	2705	I11	2732	G11	2753	F7	2796	G3	3663	C7	3682
2674	D6	2685	D10	2706	H9	2733	F11	2754	F7	2810	G6	3664	B7	3688
2675	H6	2686	C9	2707	I9	2734	G10	2760	G11	2811	G6	3665	B7	3689
2676	H6	2687	D9	2710	G8	2735	F10	2761	F11	3501	E6	3673	E8	3694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2791
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2787
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2796
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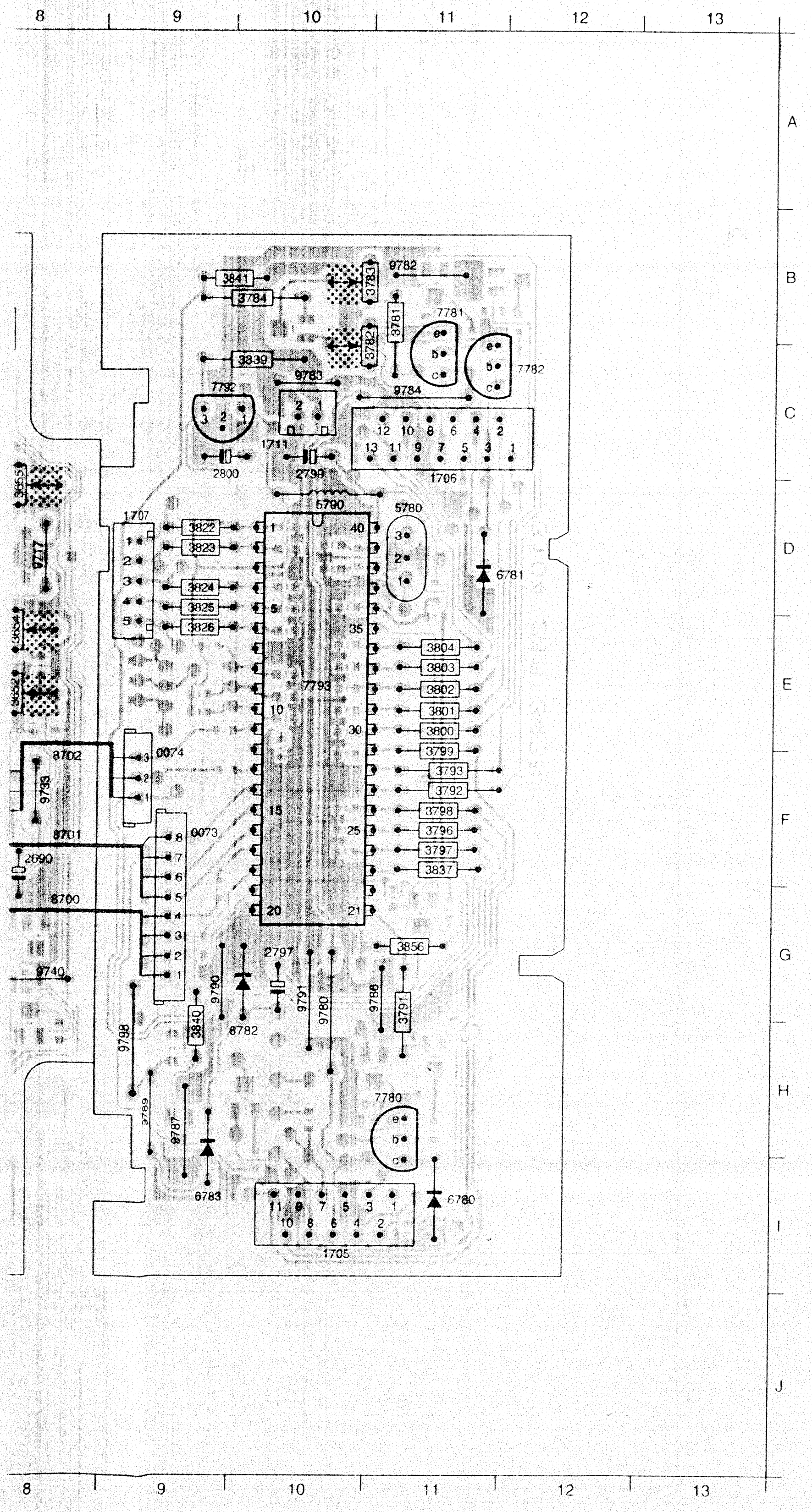
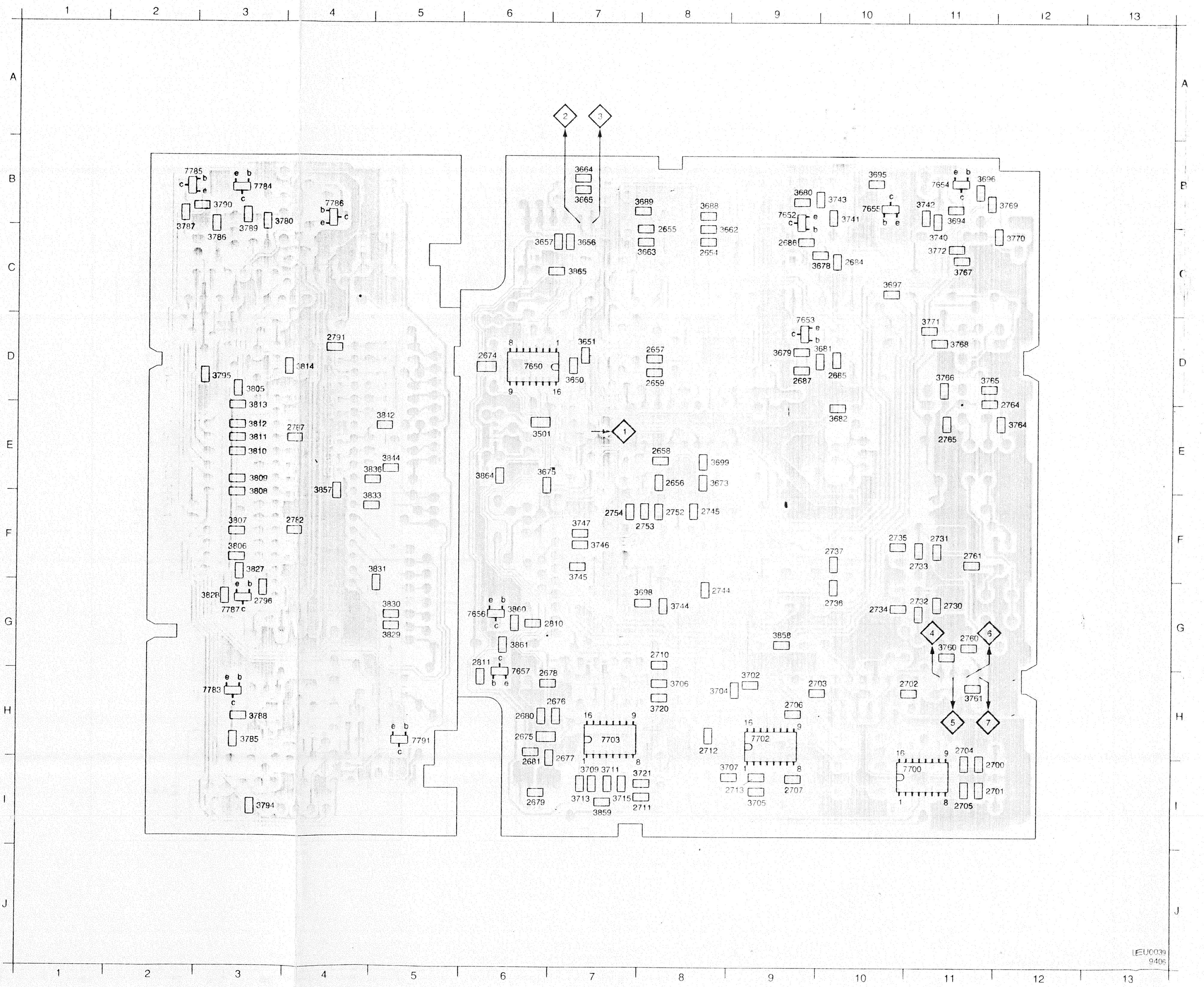
3788
3785
3794

ETF3 DOLBY B - CHIPS

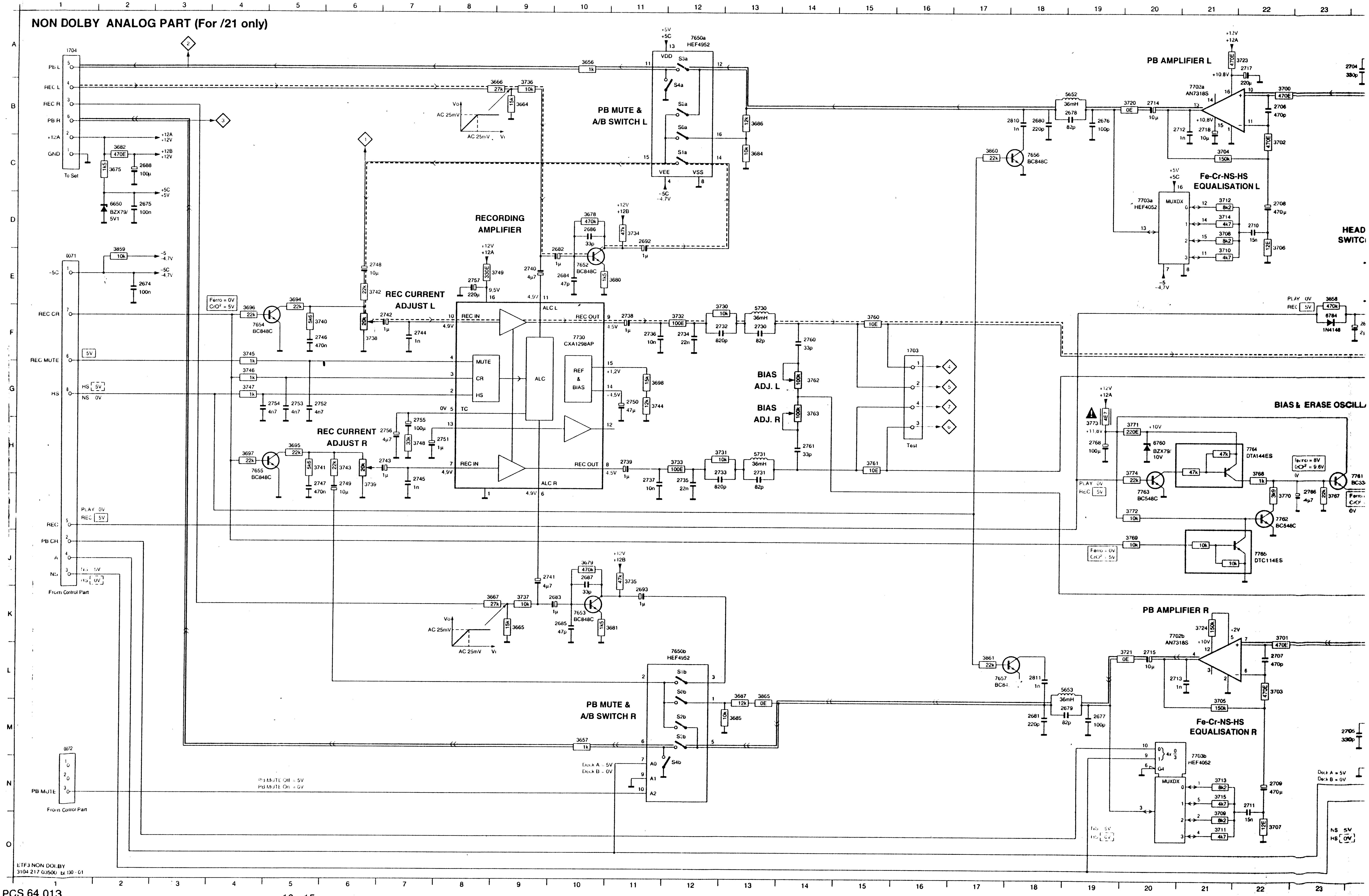
E11	5650	B6	6780	I11	7763	D2	9700	I3	9712	D5	9727	F7	9782	B11
D9	5651	B6	6781	D11	7764	D3	9701	I4	9715	D7	9728	G7	9783	C10
D9	5652	H7	6782	H9	7765	C3	9703	G6	9716	D7	9730	E7	9784	C11
D9	5653	I7	6783	I9	7780	H11	9704	H6	9717	D8	9731	E7	9786	G11
D9	5730	G3	6784	G5	7781	B11	9705	H4	9718	D8	9732	E7	9787	H9
E9	5731	F3	7651	E6	7782	C12	9706	H4	9719	C7	9733	F8	9789	H9
F11	5760	E3	7701	G3	7792	C9	9707	H4	9720	C7	9734	C6	9790	G9
C10	5780	D11	7730	F6	7793	E10	9708	I7	9721	C7	9736	D6	9791	G10
H9	5790	D10	7760	D3	8700	G8	9709	C5	9722	G4	9737	E5	9798	H9
B9	6650	G8	7761	D3	8701	F8	9710	C5	9723	F4	9740	G8	9799	G8
G11	6760	D3	7762	C2	8702	F8	9711	C5	9724	F4	9780	H10.		

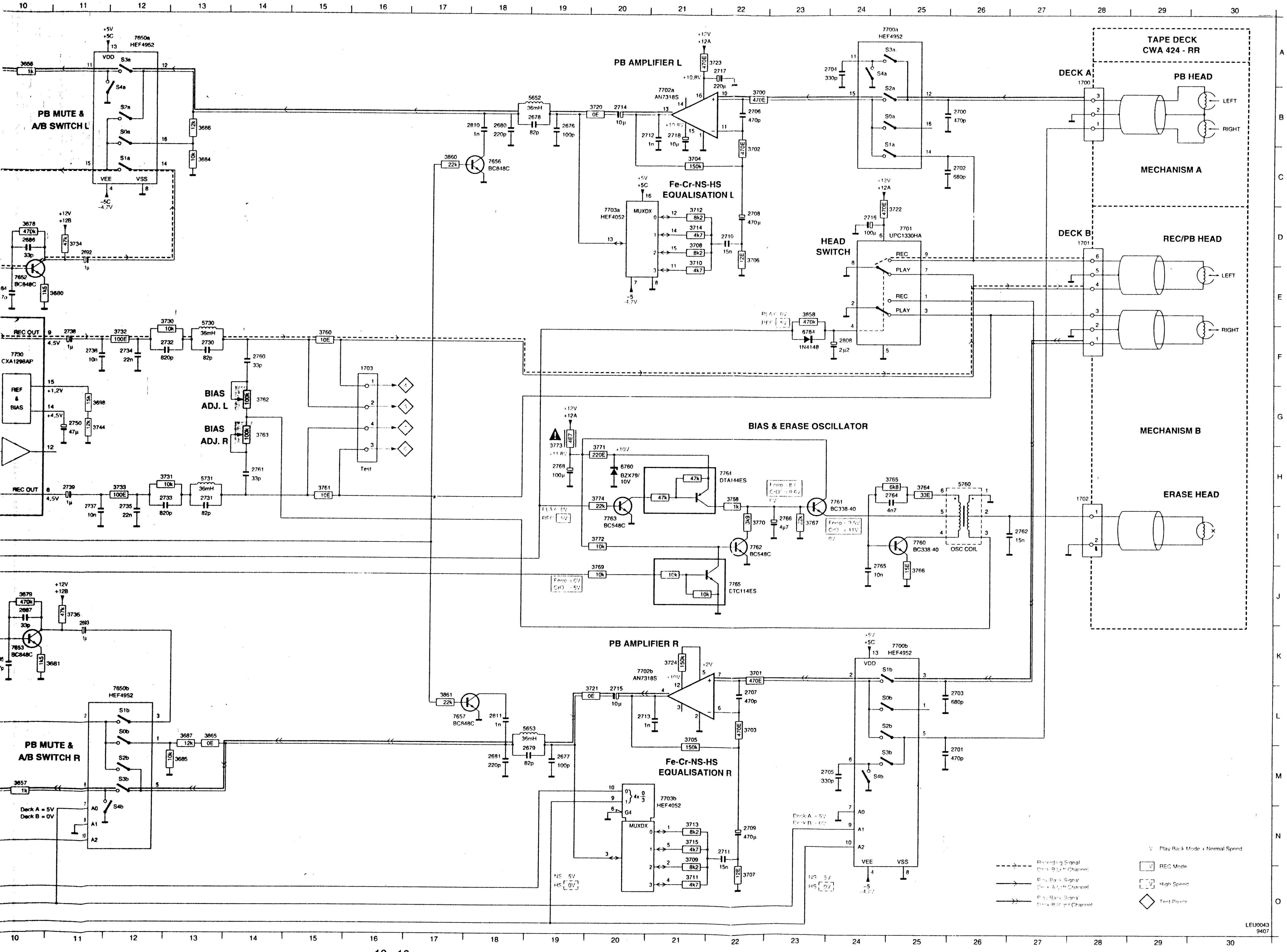
2654	C8	2677	I7	2700	I11	2711	I7	2736	G10	2764	E12	3650	D7	3675	E6	3695	B10	3707	I8	3742	B11	3765	D11	3785	H3	3806	F3	3827	F3	3857	F4	7653	D9	7784	B3
2655	C8	2678	H6	2701	I11	2712	H8	2737	F10	2765	E11	3651	D7	3678	C9	3696	B11	3709	I7	3743	B10	3766	D11	3786	C3	3807	F3	3828	G3	3858	G9	7654	B11	7785	B2
2656	E8	2679	I6	2702	H10	2713	I8	2744	G8	2782	F4	3656	C7	3679	D9	3697	C10	3711	I7	3744	G8	3767	C11	3787	C2	3808	F3	3829	G5	3859	I7	7655	B10	7786	B4
2657	D8	2680	H6	2703	H9	2730	G11	2745	F8	2787	E4	3657	C6	3680	B9	3698	G7	3713	I7	3745	F7	3768	D11	3788	H3	3809	E3	3830	G5	3860	G6	7656	G6	7787	G3
2658	E8	2681	I6	2704	H11	2731	F11	2752	F8	2791	D4	3662	C8	3681	D9	3699	E8	3715	I7	3746	F7	3769	B12	3789	C3	3810	E3	3831	F4	3861	G6	7657	H6	7791	H5
2659	D8	2684	C10	2705	I11	2732	G11	2753	F7	2796	G3	3663	C7	3682	E10	3702	H9	3720	H8	3747	F7	3770	C12	3790	B3	3811	E3	3833	F4	3864	E6	7700	I10		
2674	D6	2685	D10	2706	H9	2733	F11	2754	F7	2810	G6	3664	B7	3688	B8	3704	H8	3721	I7	3760	G11	3771	D11	3794	I3	3812	E3	3836	E4	3865	C7	7702	H9		
2675	H6	2686	C9	2707	I9	2734	G10	2760	G11	2811	G6	3665	B7	3689	B7	3705	I9	3740	C11	3761	H11	3772	C11	3795	D3	3813	E3	3842	E5	7650	D6	7703	H7		
2676	H6	2687	D9	2710	G8	2735	F10	2761	F11	3501	E6	3673	E8	3694	B11	3706	H8	3741	B10	3764	E12	3780	B3	3805	D3	3814	D4	3844	E5	7652	B9	7783	H3		





NON DOLBY ANALOG PART (For /21 only)


NON DOLBY ANALOG PART (For /21 only)
1704
PB L
REC L
REC R
PB R
+12A
GND
To Set
0071
-5C
REC CR
REC MUTE
HS
REC
PB CH
A
NS
From Control Part
0072
PB MUTE
From Control Part
PB MUTE &
A/B SWITCH L
7650a
HEF4952
PB MUTE &
A/B SWITCH R
7650b
HEF4952
RECORDING
AMPLIFIER
REC CURRENT
ADJUST L
REC CURRENT
ADJUST R
7730
CXA1298AP
REC IN
REC OUT
ALC L
ALC R
MUTE
CR
HS
ALC
REF & BIAS
TC
BIAS
ADJ. L
BIAS
ADJ. R
1703
Test
PB AMPLIFIER L
7702a
AN7318S
PB AMPLIFIER R
7702b
AN7318S
Fe-Cr-NS-HS
EQUALISATION L
7703a
HEF4052
Fe-Cr-NS-HS
EQUALISATION R
7703b
HEF4052
MUXDX
HEAD
SWITC
BIAS & ERASE OSCILL
7764
DTA144ES
7765
DTC114ES
7762
BC548C
7763
BC548C
7652
BC848C
7653
BC848C
7654
BC848C
7655
BC848C
7656
BC848C
7657
Ferro = 0V
CrO² = 5V
PLAY 0V
REC 5V
Pb MUTE Off = 5V
PB MUTE On = 0V
Deck A = 5V
Deck B = 0V
AC 25mV
Vo
Vi
ETF3 NON DOLBY
3104 217 03500


PB MUTE & A/B SWITCH L
7650a HEF4952
PB AMPLIFIER L
7702a AN7318S
Fe-Cr-NS-HS EQUALISATION L
7703a HEF4052
MUXDX
7700a HEF4952
HEAD SWITCH
7701 UPC1330HA
REC
PLAY
TAPE DECK CWA 424 - RR
DECK A
PB HEAD
LEFT
RIGHT
MECHANISM A
DECK B
REC/PB HEAD
MECHANISM B
ERASE HEAD
REC OUT
7730 CXA1298AP
REF & BIAS
BIAS ADJ. L
BIAS ADJ. R
Test
BIAS & ERASE OSCILLATOR
7764 DTA144ES
7765 DTC114ES
7761 BC338-40
7760 BC338 40
7762 BC548C
7763 BC548C
OSC COIL
7656 BC848C
7657 BC848C
7652 BC848C
7653 BC848C
PB AMPLIFIER R
7702b AN7318S
Fe-Cr-NS-HS EQUALISATION R
7703b HEF4052
7700b HEF4952
PB MUTE & A/B SWITCH R
7650b HEF4952
Deck A = 5V
Deck B = 0V
Recording Signal Deck B Left Channel
Play Back Signal Deck A Left Channel
Play Back Signal Deck B Right Channel
V Play Back Mode + Normal Speed
REC Mode
High Speed
Test Points
LEU0043
9407

0071	E1
0072	M1
1700	A28
1701	D28
1702	H28
1703	F16
1704	A1
2674	E2
2675	D2
2676	B19
2677	M19
2678	B18
2679	M18
2680	B18
2681	M18
2682	E9
2683	K9
2684	E10
2685	K10
2686	D10
2687	J10
2688	C2
2692	D11
2693	K11
2700	B26
2701	M26
2702	C26
2703	L26
2704	A23
2705	M23
2706	B22
2707	L22
2708	D22
2709	N22
2710	D22
2711	N22
2712	B20
2713	L20
2714	B20
2715	L20
2716	D24
2717	A22
2718	B21
2730	F13
2731	H13
2732	F12
2733	H12
2734	F12
2735	I12
2736	F11
2737	I11
2738	F11
2739	H11
2740	E9
2741	J9
2742	F6
2743	H6
2744	F7
2745	I7
2746	F5
2747	I5
2748	E6
2749	I6
2750	G11
2751	H8
2752	G5
2753	G5
2754	G5
2755	H7
2756	H7
2757	E8
2760	F14
2761	H14
2762	I27
2764	H24
2765	J24
2766	I23
2768	H19
2808	F24
2810	B17
2811	L18
3656	A10
3657	M10
3664	B9
3665	K9
3666	B8
3667	K8
3675	C2
3678	D10
3679	J10
3680	E11
3681	K11
3682	C2
3684	C13
3685	M13
3686	B13
3687	L13
3694	E5
3695	H5
3696	F4
3697	H4
3698	G11
3700	B22
3701	K22
3702	C22
3703	L22
3704	C21
3705	L21
3706	D22
3707	O22
3708	D21
3709	N21
3710	D21
3711	O21
3712	D21
3713	N21
3714	D21
3715	N21
3720	B19
3721	L19
3722	D25
3723	A21
3724	K21
3730	F12
3731	H12
3732	F12
3733	H12
3734	D11
3735	J11
3736	B9
3737	K9
3738	F6
3739	I6
3740	F5
3741	H5
3742	E6
3743	H6
3744	G11
3745	F4
3746	G4
3747	G4
3748	H7
3749	E8
3760	F15
3761	H15
3762	G14
3763	G14
3764	H25
3765	H24
3766	J25
3767	I23
3768	H22
3769	J20
3770	I22
3771	H20
3772	I20
3773	H19
3774	H20
3858	E23
3859	E2
3860	C17
3861	L17
3865	L13
5652	B18
5653	L18
5730	F13
5731	H13
5760	H26
6650	D2
6760	H20
6784	F23
7650a	B11
7650b	M11
7652	E10
7653	K10
7654	F4
7655	H4
7656	C18
7657	L17
7700a	A24
7700b	K25
7701	D25
7702a	B21
7702b	K20
7703a	D20
7703b	M21
7730	F10
7760	I25
7761	H24
7762	I22
7763	I20
7764	H22
7765	J22
S0a	B24
S0b	L24
S1a	C24
S1b	K24
S2a	B24
S2b	L24
S3a	A24
S3b	M24
S4a	A24
S4b	M24

ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

Adjustment	Cassette	Recorder in position	Measure on	Read on	Adjust with	Value	Remarks
Deck A High Speed HS	SBC419 3150Hz	High Speed dubbing	Test point TP **1**	Counter	3782	5,4kHz ±0,5%	see #1
Deck A Norm.Speed NS	SBC419 3150Hz	Play in forward direction	Test point TP **2**	Counter	3783	3,15 kHz ±0,5%	
Wow and Flutter	SBC419 3150Hz	Play in forward direction	Test point TP **2**	Wow and Flutter meter	check	< 0.4%	
Deck A Azimuth	SBC 419 12kHz	Play in forward direction	TP **2** left ch or TP **3** right ch	AC mV meter	Left screw Norm.Dir.(>)	max. output left=right	
		Play in reverce direction			Right screw Rev.Dir.(<)		
Deck B Azimuth	SBC 419 12kHz	Play in forward direction	TP **2** left ch or TP **3** right ch	AC mV meter	Left screw Norm.Dir.(>)	max. output left=right	
		Play in reverce direction			Right screw Rev.Dir.(<)		
Bias current Chrome	-	Record mode and Chrome mode	TP **4** **5** L.ch	AC mV meter	3762	7 mV	see #2
			TP **6** **7** R.ch		3763		
Bias current Ferro	-	Record mode and Ferro mode	TP **4** **5** L.ch	AC mV meter	check	4,4mV ±0,5dB	
			TP **6** **7** R.ch		check		
Recording current	Dolby 200N Wb/m (deck A) and Chrome.cass (deck B)	Record mode and Chrome mode	TP **4** **5** L.ch	AC mV meter	3738	0,68mV	Filter out osc with audio filter see also #3
			TP **6** **7** R.ch		3739	Rec/PB Level within ±1 dB of 548 mV	
	Dolby 200N Wb/m (deck A) and Ferro.cass (deck B)	Record mode and Ferro mode	TP **4** **5** L.ch		check	0.45mV	
			TP **6** **7** R.ch		check	Rec/PB Level within ±1 dB of 548 mV	
Oscillator Frequency		Record mode	TP **4** **5** L.ch	Counter	5760	88kHz ±6kHz	

#1 Motor must be aligned for HS before NS. H.S. ratio = 1,7

#2 Bias current must be aligned for Chrome position.

#3 Recording current should be aligned using an iterative method. Perform a dubbing using test tape Dolby 200 N. Wb/m as source, and Ferro tape or Chrome tape as target blank tapes. Check that the output t.p. gives 548 mV during dubbing. Then playback the recorded tape. The record/playback level should also be 548 mV ± 0.5 dB. If not, adjust 3738 (L) and 3739 (R) accordingly.

EXPLANATION OF ABBREVIATIONS

A	Deck A or B
CRO2	Chrome
Dolby NR	Dolby Noise Reduction
Dolby Mode	Dolby Mode (Rec or Play)
DSA STR	DSA Strobe
DSA DA	DSA Data
DSA ACK	DSA Acknowledge
EOT A	End of Tape A
EOT B	End of Tape B
FE	Ferro
HS	High Speed
MODE A	Slide Deck A Up / Down
MODE B	Slide Deck B Up / Down
NC	Not Connect
NS	Normal Speed
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ L	Playback Lever Adjustment Left
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ R	Playback Lever Adjustment Right
PBL	Playback Left
PBR	Playback Right
Rec Mute	Recording Mute
Rec R	Recording Right
Rec L	Recording Left
Rec CR	Recording Chrome
REC RVS	Recording Reverse
REC	Recording
REC FWD	Recording Forward
SOL A	Solenoid A
SOL B	Solenoid B
VCC B	VCC Motor B

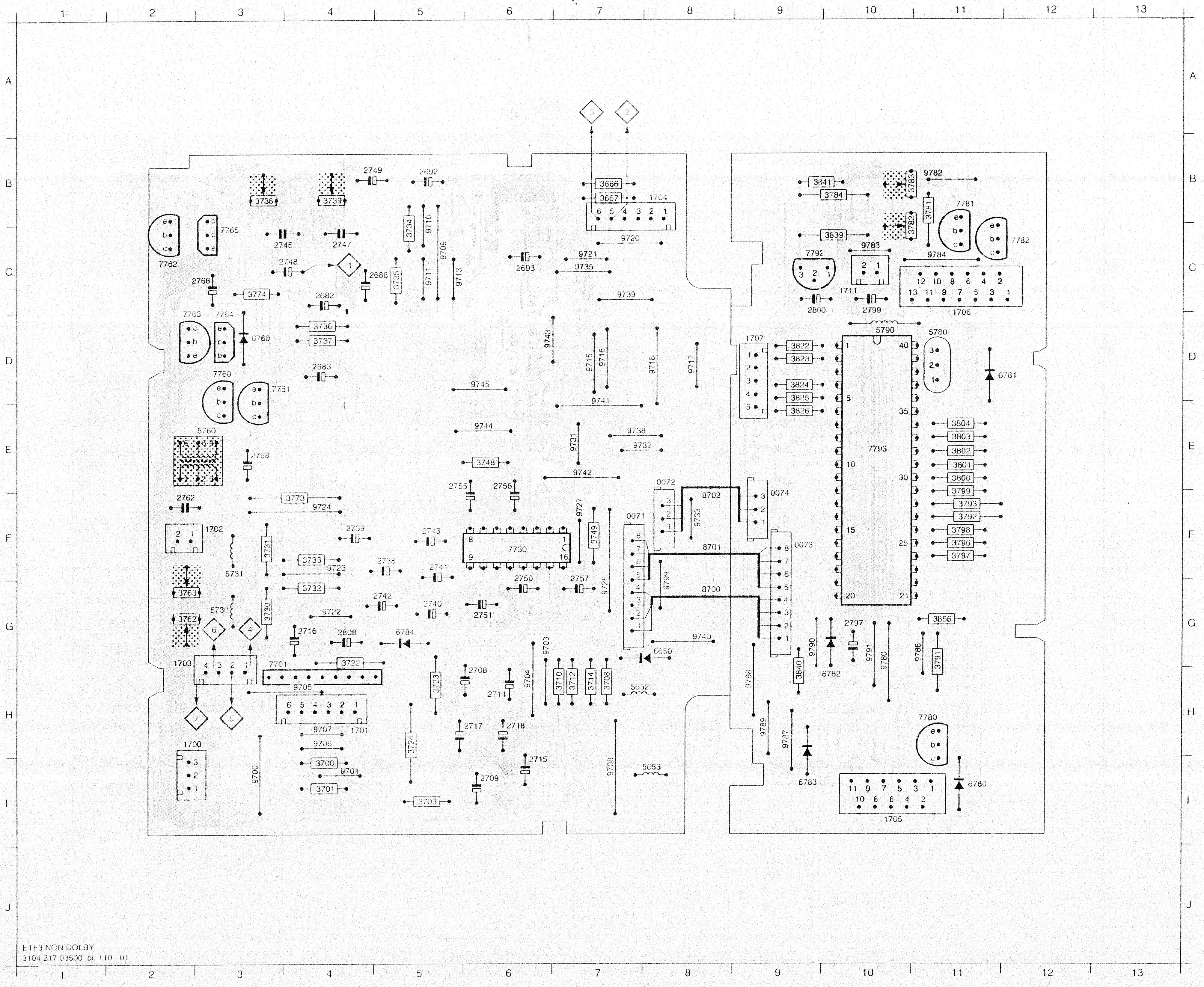
SERVICE SOLUTION for RIF INTERFERENCE

Re-adjust oscillator coil 5760 (half a turn)
so that the interference is gone.

ETF3 NON-DOLBY - COMPONENTS

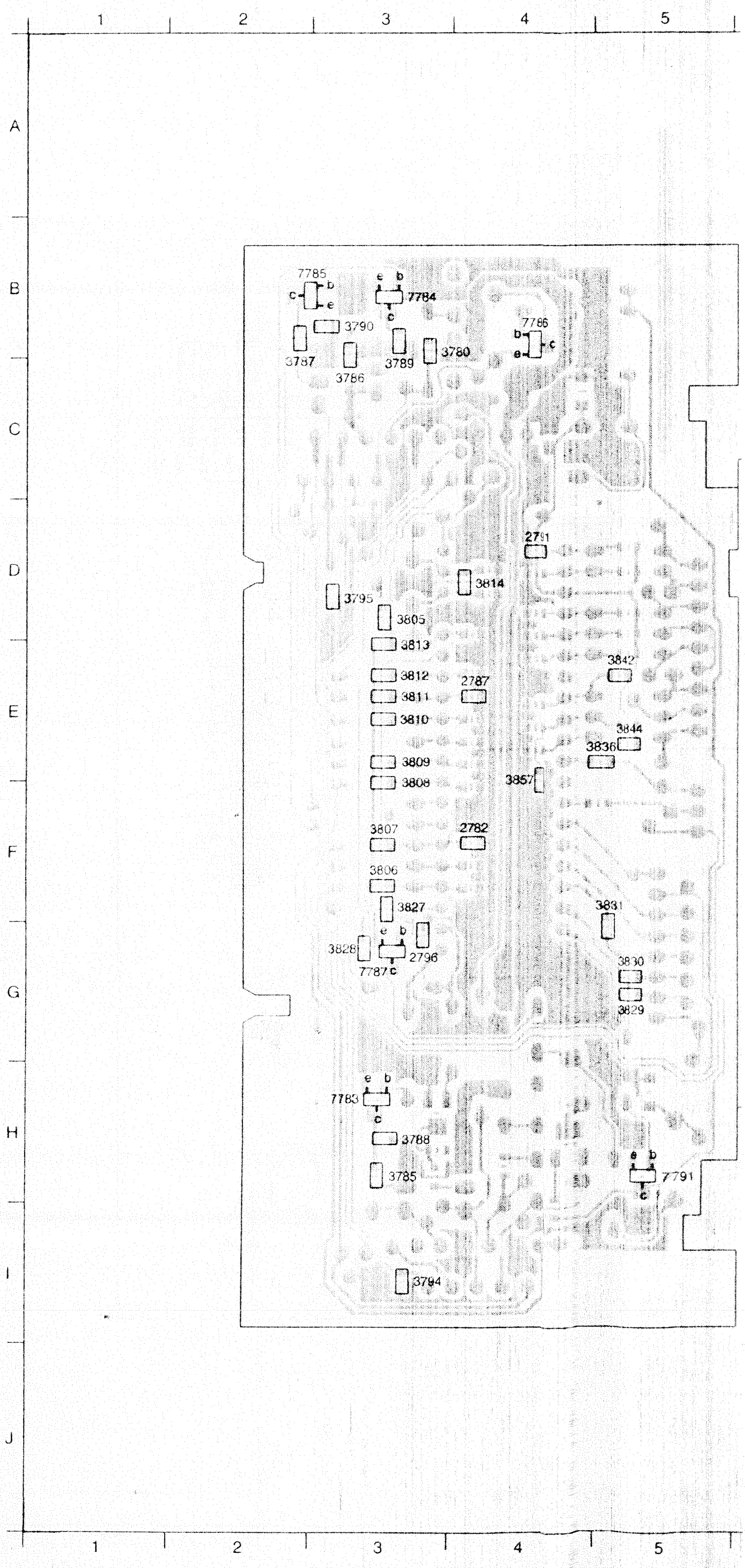
0071	F7	1706	D11	2714	H6	2743	F5	2762	F2	3701	I4	3731	F3	3749	F7	3792	F11	3804	E11	5652	H7	6781	D11	7764	D3	9700	I3
0072	E8	1707	D9	2715	I6	2746	C3	2766	C2	3703	I5	3732	G4	3762	G2	3793	F11	3822	D9	5653	I7	6782	H9	7765	C3	9701	I4
0073	F9	1711	C10	2716	G4	2747	C4	2768	E3	3708	H7	3733	F4	3763	G2	3796	F11	3823	D9	5730	G3	6783	I9	7780	H11	9703	G6
0074	F9	2682	C4	2717	H6	2748	C3	2797	G10	3710	H7	3734	C5	3773	F4	3797	F11	3824	D9	5731	F3	6784	G5	7781	B11	9704	H6
1700	H2	2683	D4	2718	H6	2749	B4	2799	D10	3712	H7	3735	C5	3774	C3	3798	F11	3825	D9	5760	E3	7701	G3	7782	C12	9705	H4
1701	H4	2688	C4	2738	F5	2750	G6	2800	D9	3714	H7	3736	D4	3781	B11	3799	F11	3826	E9	5780	D11	7730	F6	7792	C9	9706	H4
1702	F3	2692	B5	2739	F4	2751	G6	2808	G4	3722	G4	3737	D4	3782	C11	3800	E11	3839	C10	5790	D10	7760	D3	7793	E10	9707	H4
1703	G2	2693	C6	2740	G5	2755	E5	3666	B7	3723	H5	3738	B3	3783	B11	3801	E11	3840	H9	6650	G8	7761	D3	8700	G8	9708	I7
1704	B8	2708	H6	2741	F5	2756	E6	3667	B7	3724	H5	3739	B4	3784	B10	3802	E11	3841	B9	6760	D3	7762	C2	8701	F8	9709	C5
1705	I10	2709	I6	2742	G4	2757	G7	3700	I4	3730	G3	3748	E6	3791	H11	3803	E11	3856	G11	6780	I11	7763	D2	8702	F8	9710	C5

9711	C5	9724	F4	9741	E7	9787	H9
9713	C5	9727	F7	9742	E7	9789	H9
9715	D7	9728	G7	9743	D6	9790	G9
9716	D7	9731	E7	9744	E6	9791	G10
9717	D8	9732	E7	9745	D6	9798	H9
9718	D8	9733	F8	9780	H10	9799	G8
9720	C7	9735	C7	9782	B11		
9721	C7	9738	E7	9783	C10		
9722	G4	9739	C7	9784	C11		
9723	F4	9740	G8	9786	G11		



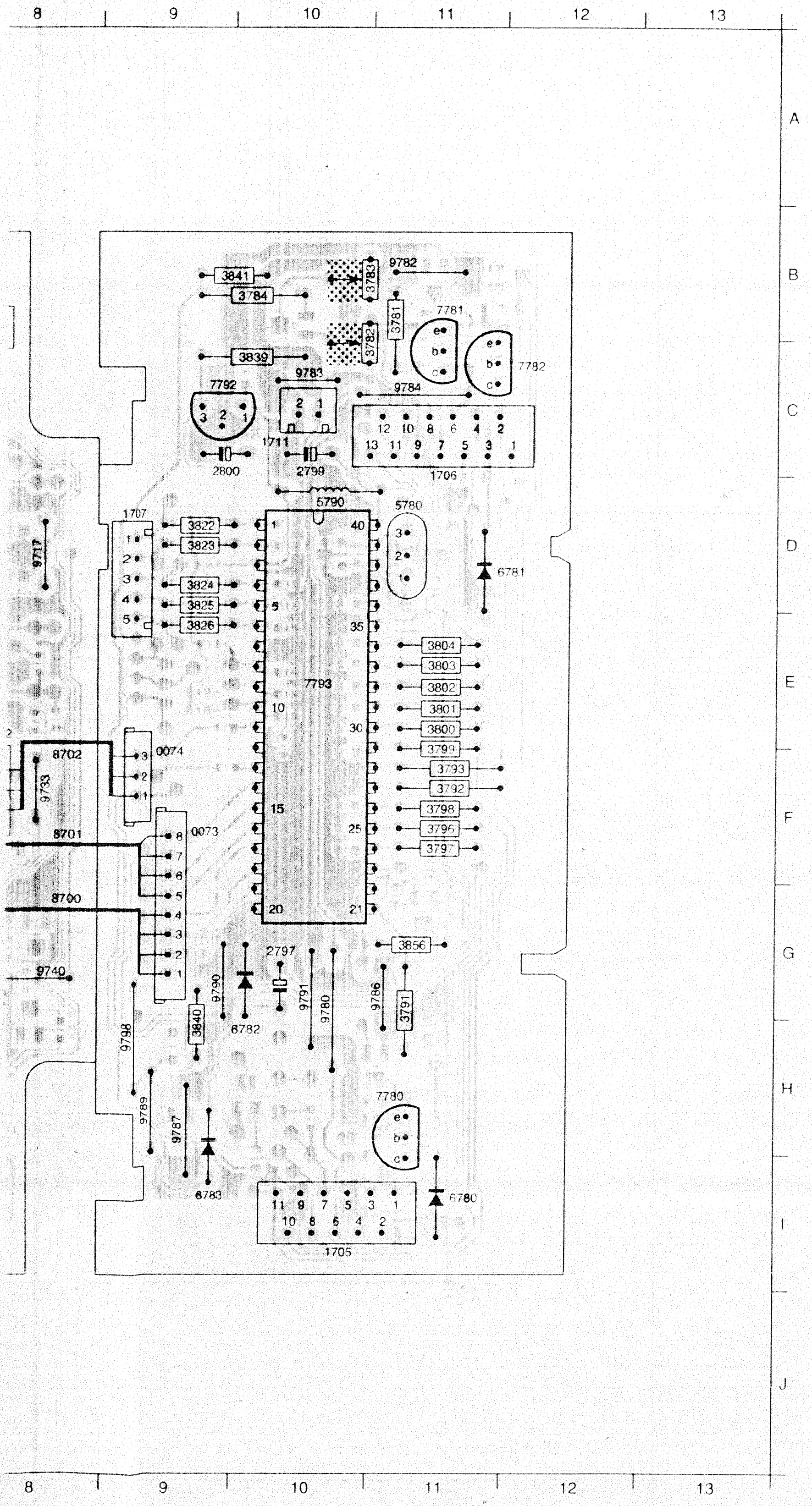
ETF3 NON-DOLBY - CHIPS

2674	D6	2684	C10	2704	H11	2730	G11	2744	G8	2765	E11	3657	C6	36
2675	H6	2685	D10	2705	I11	2731	F11	2745	F8	2782	F4	3664	B7	36
2676	H7	2686	C9	2706	H9	2732	G11	2752	F8	2787	E4	3665	B7	36
2677	I7	2687	D9	2707	I9	2733	F11	2753	F8	2791	D4	3678	C9	36
2678	H6	2700	I11	2710	G8	2734	G10	2754	F7	2796	G3	3679	D9	36
2679	I6	2701	I11	2711	I7	2735	F10	2760	G11	2810	G6	3680	B9	36
2680	H6	2702	H10	2712	H8	2736	G10	2761	F11	2811	G6	3681	D9	36
2681	I6	2703	H9	2713	I9	2737	F10	2764	E12	3656	C7	3682	E10	36



ETF3 NON-DOLBY - CHIPS

	H7	6781	D11	7764	D3	9700	I3	9711	C5	9724	F4	9741	E7	9787	H9
	I7	6782	H9	7765	C3	9701	I4	9713	C5	9727	F7	9742	E7	9789	H9
	G3	6783	I9	7780	H11	9703	G6	9715	D7	9728	G7	9743	D6	9790	G9
	F3	6784	G5	7781	B11	9704	H6	9716	D7	9731	E7	9744	E6	9791	G10
	E3	7701	G3	7782	C12	9705	H4	9717	D8	9732	E7	9745	D6	9798	H9
	D11	7730	F6	7792	C9	9706	H4	9718	D8	9733	F8	9780	H10	9799	G8
	D10	7760	D3	7793	E10	9707	H4	9720	C7	9735	C7	9782	B11		
	G8	7761	D3	8700	G8	9708	I7	9721	C7	9738	E7	9783	C10		
	D3	7762	C2	8701	F8	9709	C5	9722	G4	9739	C7	9784	C11		
	I11	7763	D2	8702	F8	9710	C5	9723	F4	9740	G8	9786	G11		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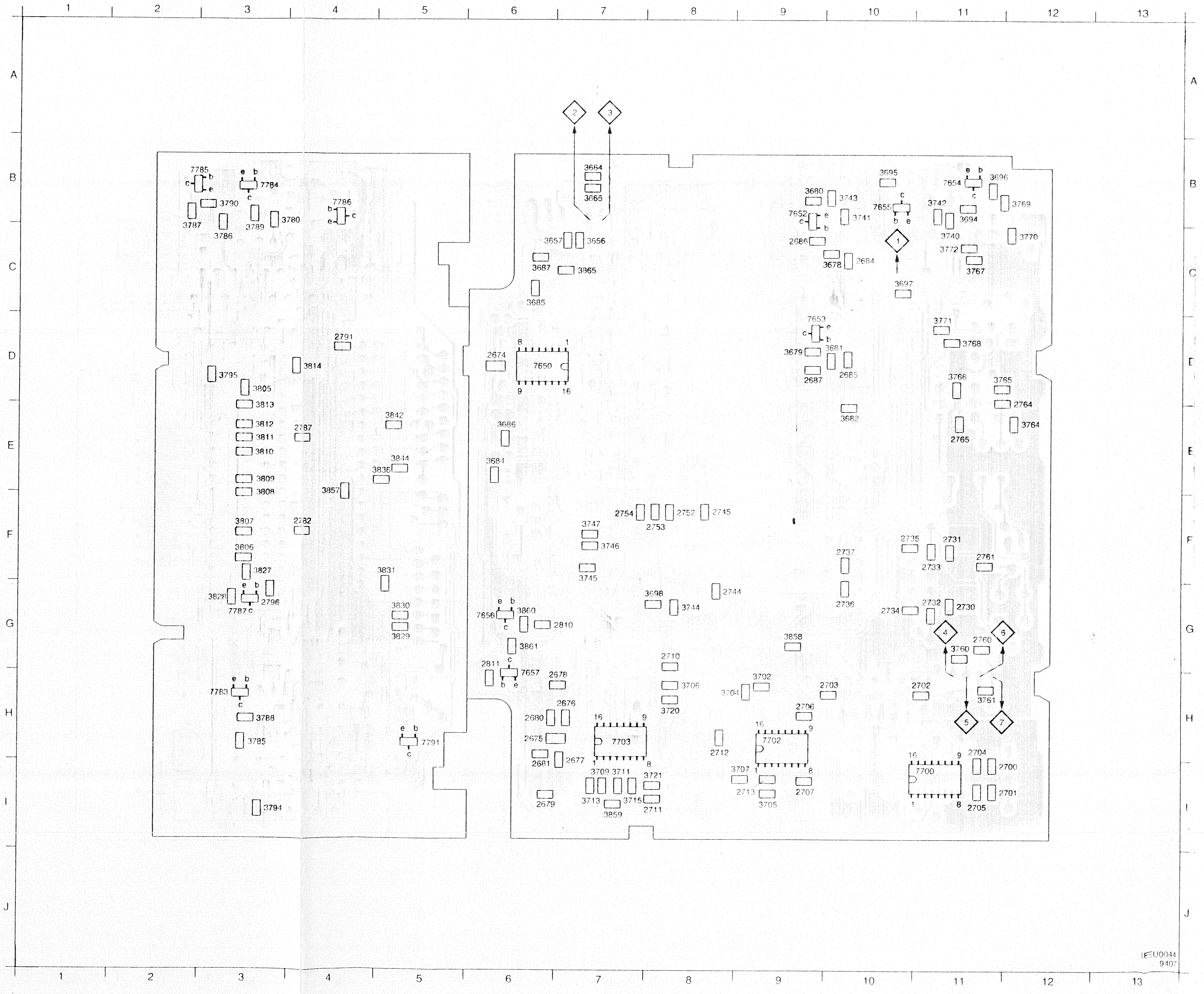
2674	D6	2684	C10	2704	H11	2730	G11	2744	G8	2765	E11	3657	C6	3684	E6	3698	G7	3713	I7	3744	G8	3766	D11	3785	H3	3805	D3	3813	E3	3842	E5	7650	D6	7702	H9
2675	H6	2685	D10	2705	I11	2731	F11	2745	F8	2782	F4	3664	B7	3685	C6	3702	H9	3715	I7	3745	F7	3767	C11	3786	C3	3806	F3	3814	D4	3844	E5	7652	B9	7703	H7
2676	H7	2686	C9	2706	H9	2732	G11	2752	F8	2787	E4	3665	B7	3686	E6	3704	H8	3720	H8	3746	F7	3768	D11	3787	C2	3807	F3	3827	F3	3857	F4	7653	D9	7783	H3
2677	I7	2687	D9	2707	I9	2733	F11	2753	F8	2791	D4	3678	C9	3687	C6	3705	I9	3721	I7	3747	F7	3769	B12	3788	H3	3808	F3	3828	G3	3858	G9	7654	B11	7784	B3
2678	H6	2700	I11	2710	G8	2734	G10	2754	F7	2796	G3	3679	D9	3694	B11	3706	H8	3740	C11	3760	G11	3770	C12	3789	C3	3809	E3	3829	G5	3859	I7	7655	B10	7785	B2
2679	I6	2701	I11	2711	I7	2735	F10	2760	G11	2810	G6	3680	B9	3695	B10	3707	I8	3741	B10	3761	H11	3771	D11	3790	B3	3810	E3	3830	G5	3860	G6	7656	G6	7786	B4
2680	H6	2702	H10	2712	H8	2736	G10	2761	F11	2811	G6	3681	D9	3696	B11	3709	I7	3742	B11	3764	E12	3772	C11	3794	I3	3811	E3	3831	F5	3861	G6	7657	H6	7787	G3
2681	I6	2703	H9	2713	I9	2737	F10	2764	E12	3656	C7	3682	E10	3697	C10	3711	I7	3743	B10	3765	D11	3780	B3	3795	D3	3812	E3	3836	E4	3865	C7	7700	I11	7791	H5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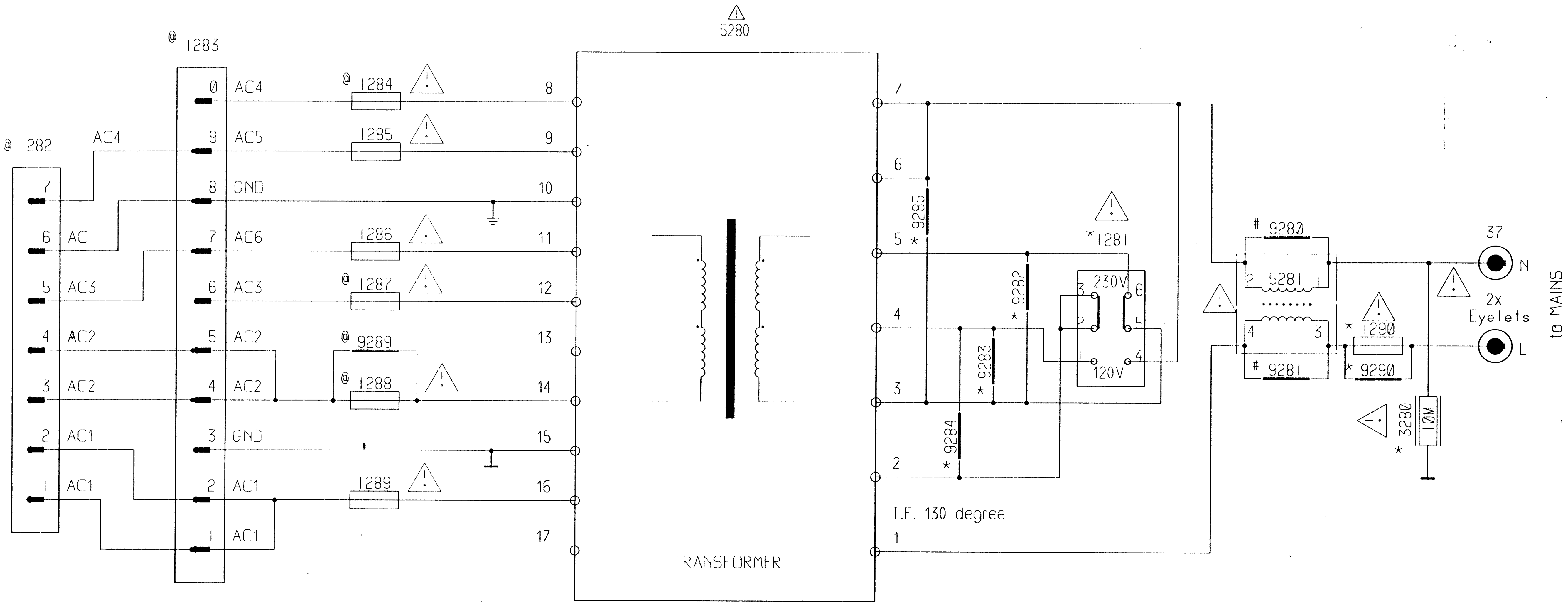
c

TRAFO CIRCUIT

TRAFO COM


5280
@ 1283
@ 1282
to/from COMBI
7
6 AC
5 AC3
4 AC2
3 AC2
2 AC1
1 AC1
AC4
10 AC4
9 AC5
8 GND
7 AC6
6 AC3
5 AC2
4 AC2
3 GND
2 AC1
1 AC1
@ 1284
1285
1286
@ 1287
@ 9289
@ 1288
1289
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16
17
TRANSFORMER
7
6
5 *
4
3
2
1
9285
9282 *
9283 *
9284 *
T.F. 130 degree
*1281
230V
120V
3
6
2
5
1
4
# 9280
2 5281 1
4 3
# 9281
* 1290
* 9290
3280 10M *
37
N
L
2x Eyelets
to MAINS

NOT IN USE (FOR PROVISION ONLY)

Note for items marked @

MODEL / ITEM	FW26	FW46
1282	Use	Not use
1283	Not use	Use
1284	Not use	Use
1287	Not use	Use
1288	Not use	Use
9289	Use	Not use
9282	Not use	Use×
9283	Not use	Use×

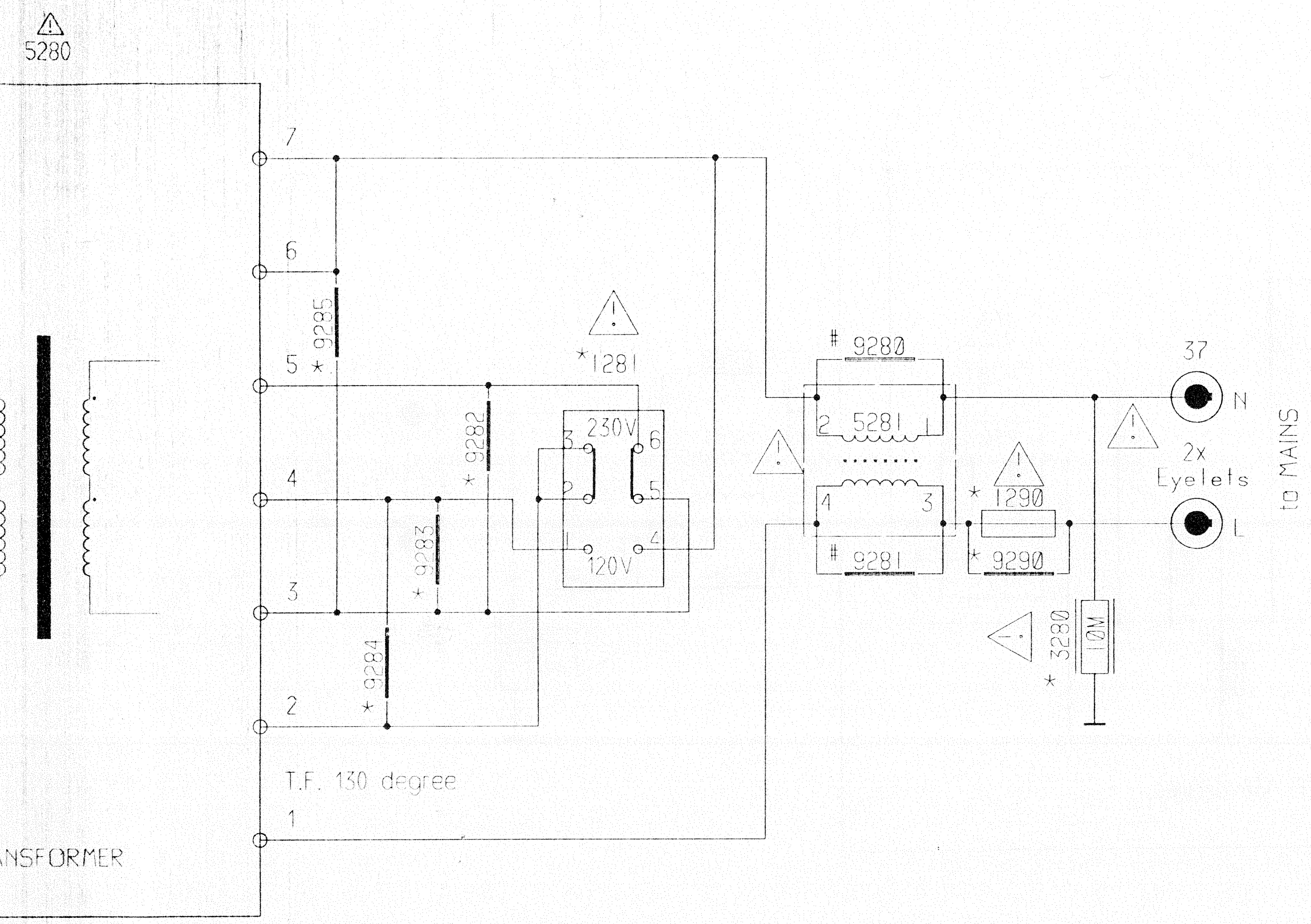
NOTE FOR ITEMS MARKED ×

VOLTAGE / ITEM	220-230V	110-127 / 220-240V	230-240V	120V	100V
1281	Not use	Use	Not use	Not use	Not use
9282	Use@	Not use	Not use	Not use	Not use
9283	Not use	Not use	Use@	Not use	Not use
9284	Not use	Not use	Not use	Use	Not Use
9285	Not use	Not use	Not use	Use	Not Use
3280	Not use	Not use	Not use	Use	Not Use
1290	Not use	Not use	Not use	Use	Not Use
9290	Use	Use	Use	Not Use	Use

Remark

For the exact value of fuses, refer to partlist

	FW26	FW46
1284	Not use	Use
1285 1286	Use	Use
1287	Not use	Use
1288	Not use	Use
1289	Use	Use


5280
7
6
5
4
3
2
1
9285
9282
9283
9284
1281
230V
120V
# 9280
5281
# 9281
1290
9290
3280
10M
37
N
L
2x
Eyelets
to MAINS
T.F. 130 degree
NSFORMER

NOT IN USE (FOR PROVISION ONLY)

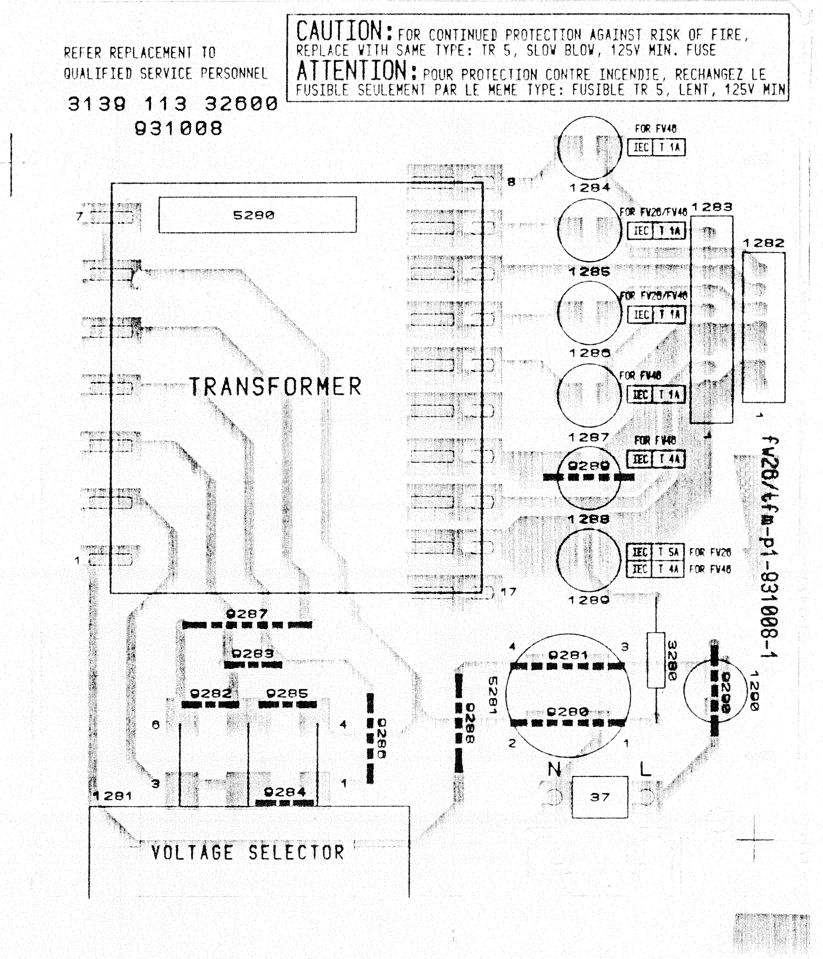
40V	120V	100V
use	Not use	Not use
use	Not use	Not use
@	Not use	Not use
use	Use	Not Use
use	Use	Not Use
use	Use	Not Use
use	Use	Not Use
e	Not Use	Use

Remark

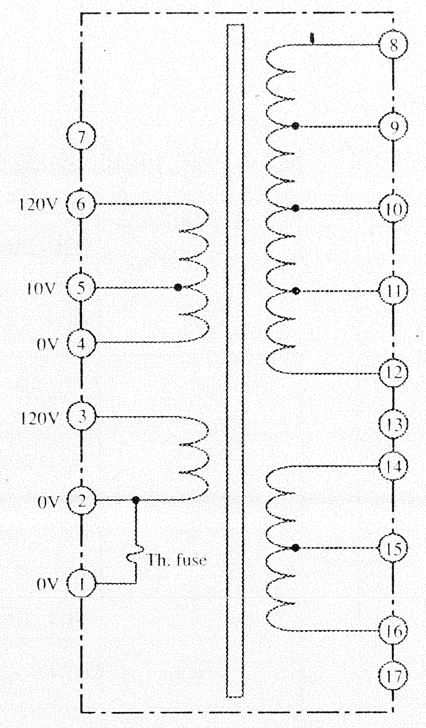
For the exact value of fuses, refer to partlist

	FW26	FW46
1284	Not use	Use
1285 1286	Use	Use *
1287	Not use	Use
1288	Not use	Use
1289	Use	Use

TRAFO COMPONENT LAYOUT


REFER REPLACEMENT TO
QUALIFIED SERVICE PERSONNEL
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE WITH SAME TYPE: TR 5, SLOW BLOW, 125V MIN. FUSE
ATTENTION: POUR PROTECTION CONTRE INCENDIE, RECHANGEZ LE FUSIBLE SEULEMENT PAR LE MEME TYPE: FUSIBLE TR 5, LENT, 125V MIN
3139 113 32600
931008
5280
TRANSFORMER
FOR FW46
IEC T 1A
1284
FOR FW26/FW46
1283
1282
1285
1286
1287
FOR FW46
1288
1289
IEC T 1.6A FOR FW26
IEC T 1A FOR FW46
9287
9283
9282
9285
9286
9284
1281
5281
9281
9280
3280
1290
9290
N
L
37
VOLTAGE SELECTOR
fw26/46m-p1-931008-1

FW46 (except /26 and /37)


120V
10V
0V
120V
0V
0V
1
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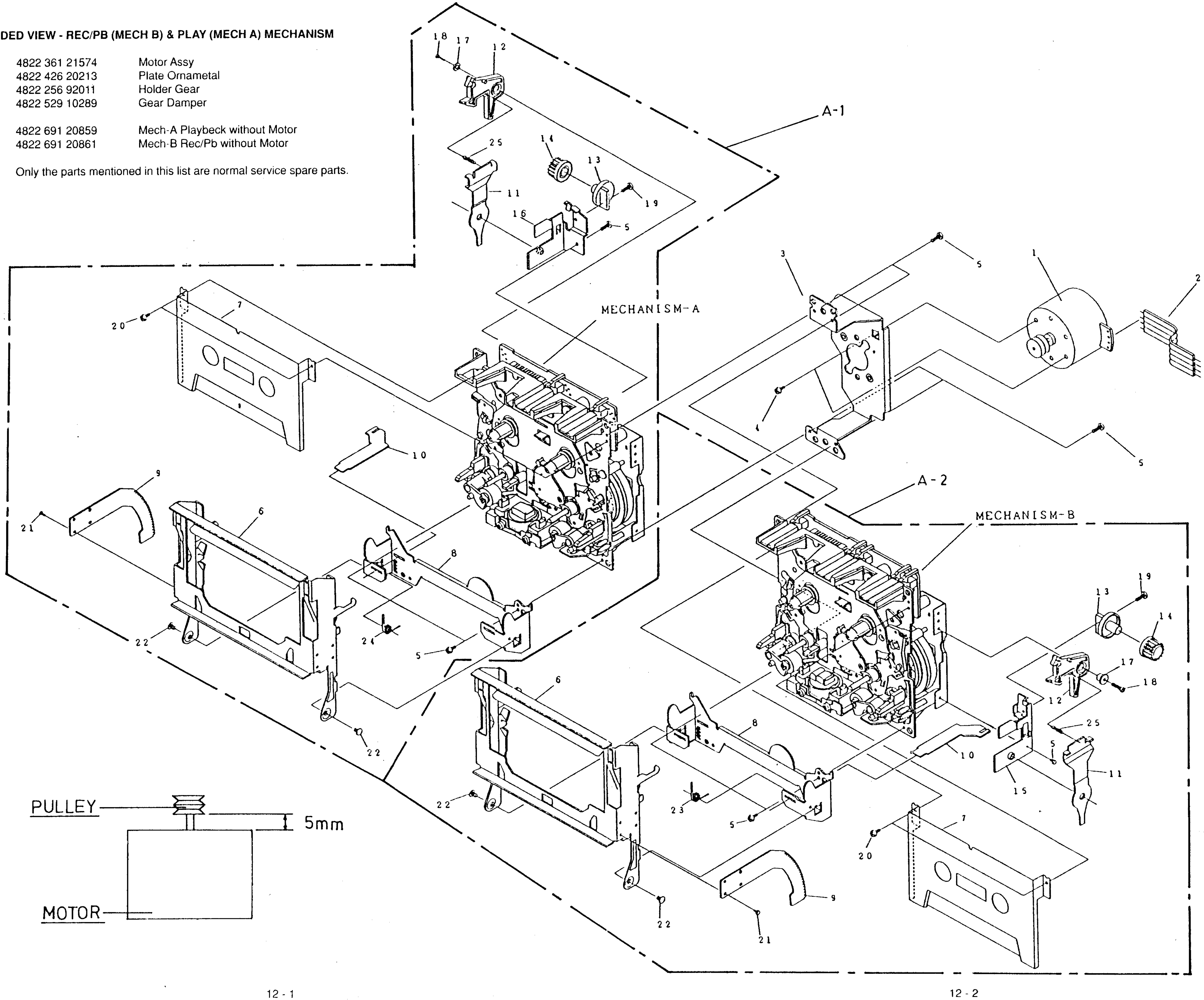
10
11
12
13
14
15
16
17
Th. fuse

4822 146 31335

EXPLODED VIEW - REC/PB (MECH B) & PLAY (MECH A) MECHANISM

1	4822 361 21574	Motor Assy
7	4822 426 20213	Plate Ornametal
13	4822 256 92011	Holder Gear
14	4822 529 10289	Gear Damper
A-1	4822 691 20859	Mech-A Playbeck without Motor
A-2	4822 691 20861	Mech-B Rec/Pb without Motor

Note: Only the parts mentioned in this list are normal service spare parts.


A-1
A-2
MECHANISM-A
MECHANISM-B
1
2
3
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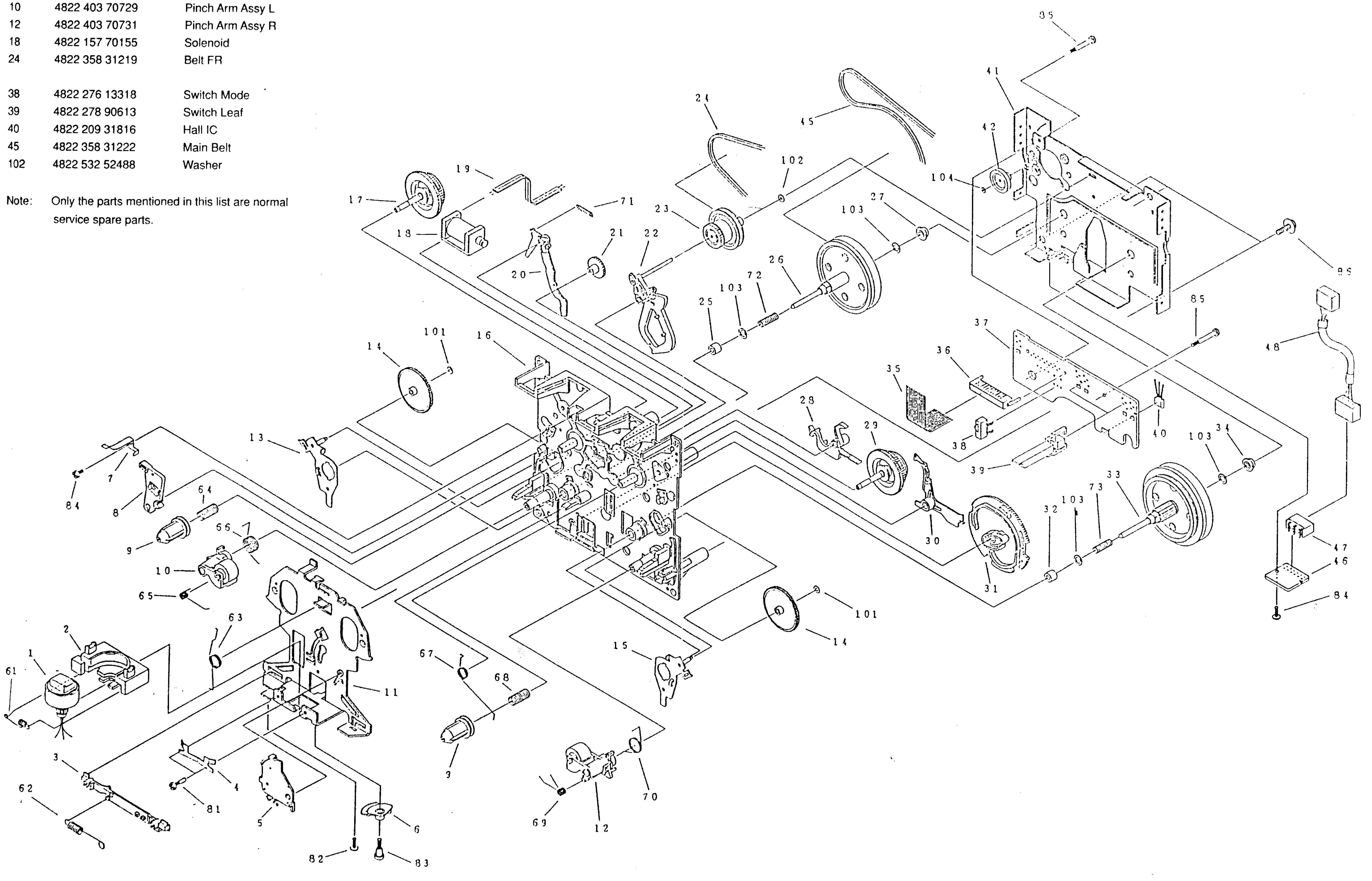
16
17
18
19
20
21
22
23
24
25
PULLEY
5mm
MOTOR

EXPLODED VIEW - PLAY (MECH A) MECHANISM

1	4822 249 30189	Play Head Assy
10	4822 403 70729	Pinch Arm Assy L
12	4822 403 70731	Pinch Arm Assy R
18	4822 157 70155	Solenoid
24	4822 358 31219	Belt FR
38	4822 276 13318	Switch Mode
39	4822 278 90613	Switch Leaf
40	4822 209 31816	Hall IC
45	4822 358 31222	Main Belt
102	4822 532 52488	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


35
41
42
104
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72
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101
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63
101
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62
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81
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69
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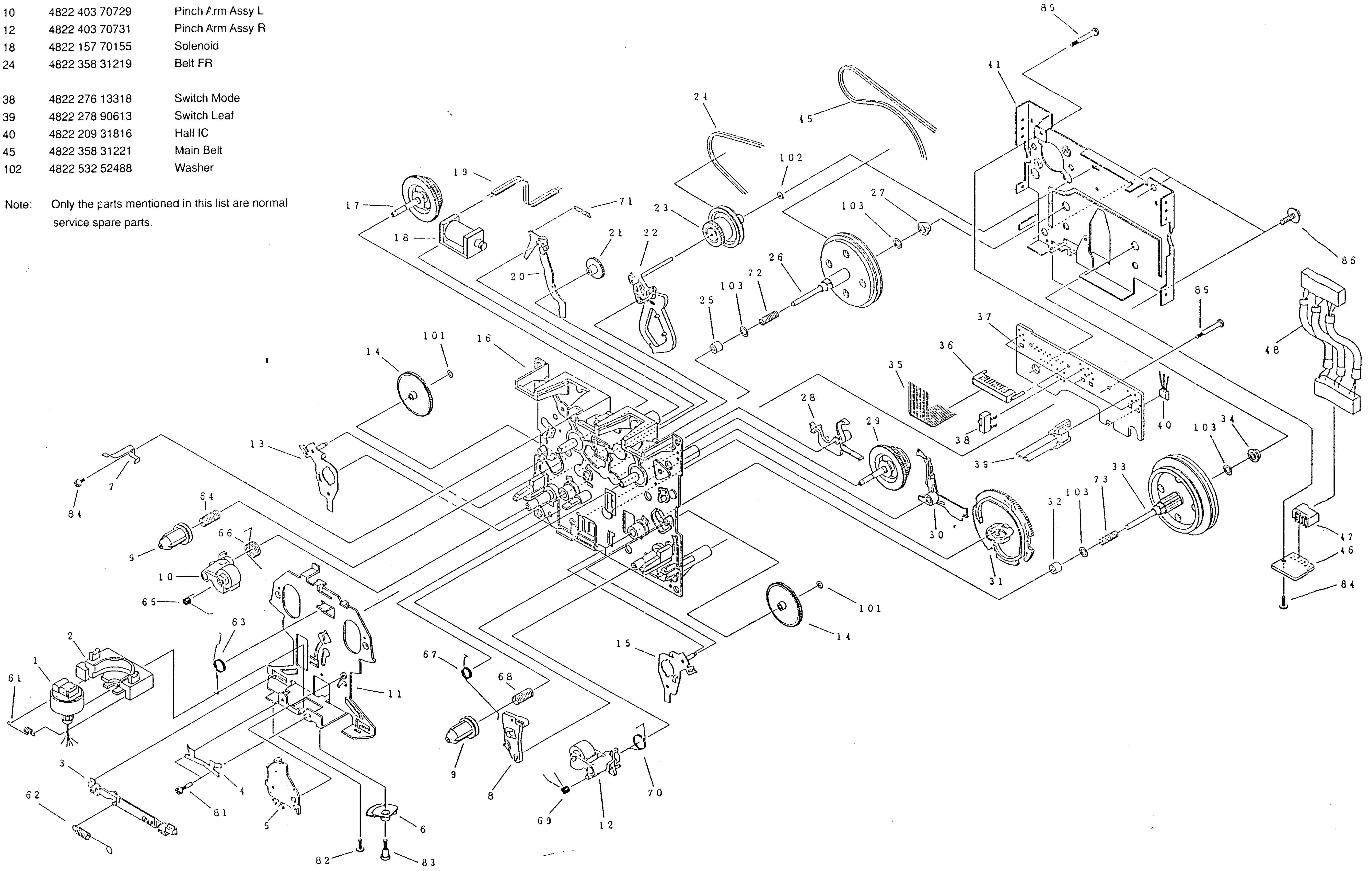
70
82
83

EXPLODED VIEW - REC/PB (MECH B) MECHANISM

1	4822 249 10472	Rec/Play Head Assy
10	4822 403 70729	Pinch Arm Assy L
12	4822 403 70731	Pinch Arm Assy R
18	4822 157 70155	Solenoid
24	4822 358 31219	Belt FR
38	4822 276 13318	Switch Mode
39	4822 278 90613	Switch Leaf
40	4822 209 31816	Hall IC
45	4822 358 31221	Main Belt
102	4822 532 52488	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


85
41
24
45
102
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71
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103
86
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37
36
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101
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101
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63
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81
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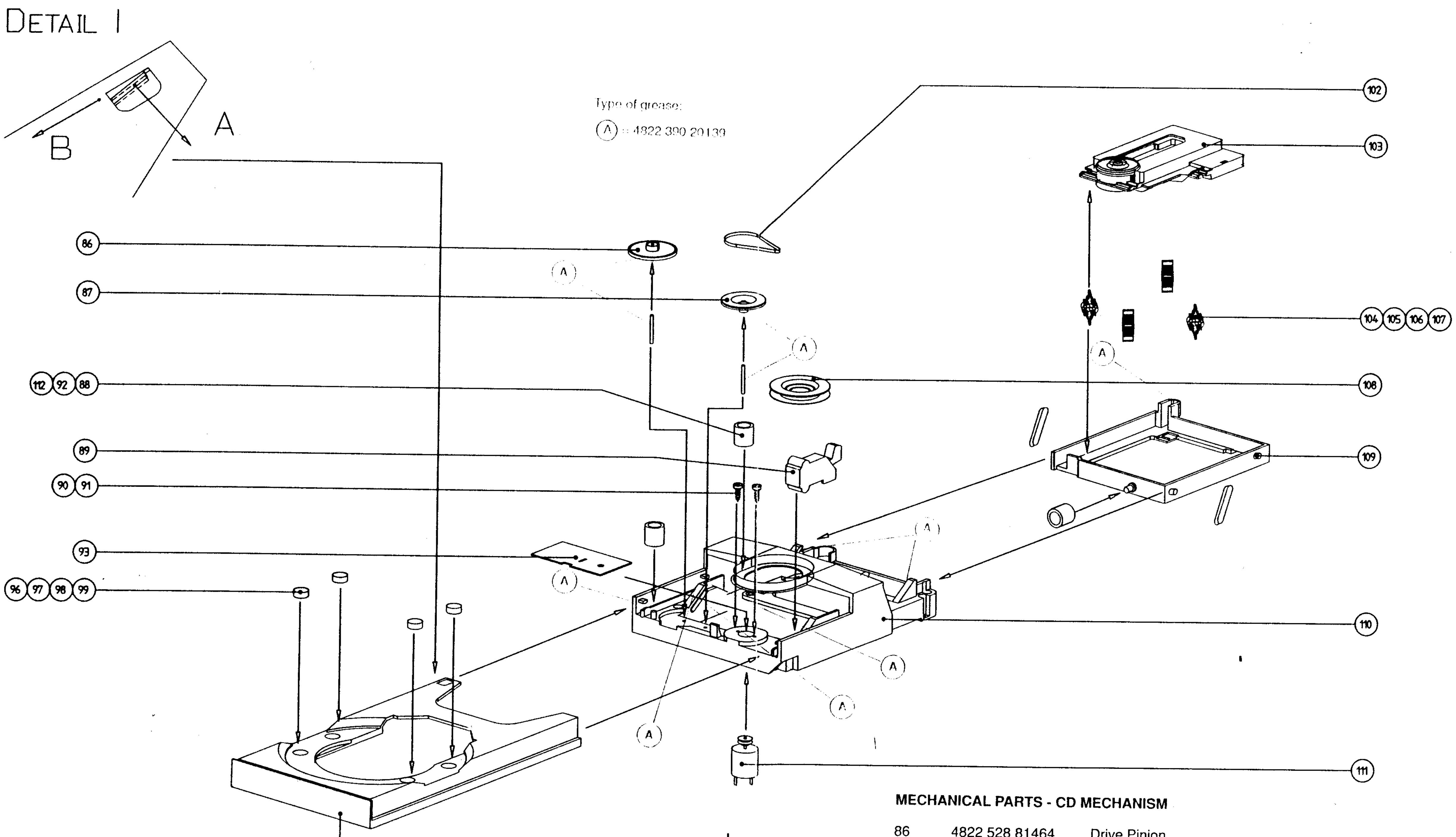
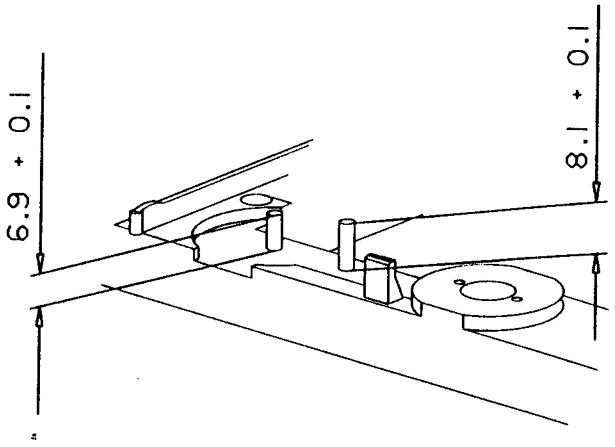
83

CD EXPLODED VIEW


DETAIL I
A
B
86
87
112 92 88
89
90 91
93
96 97 98 99
101
102
103
104 105 106 107
108
109
110
111
A

Type of grease:
Ⓐ = 4822 390 20139



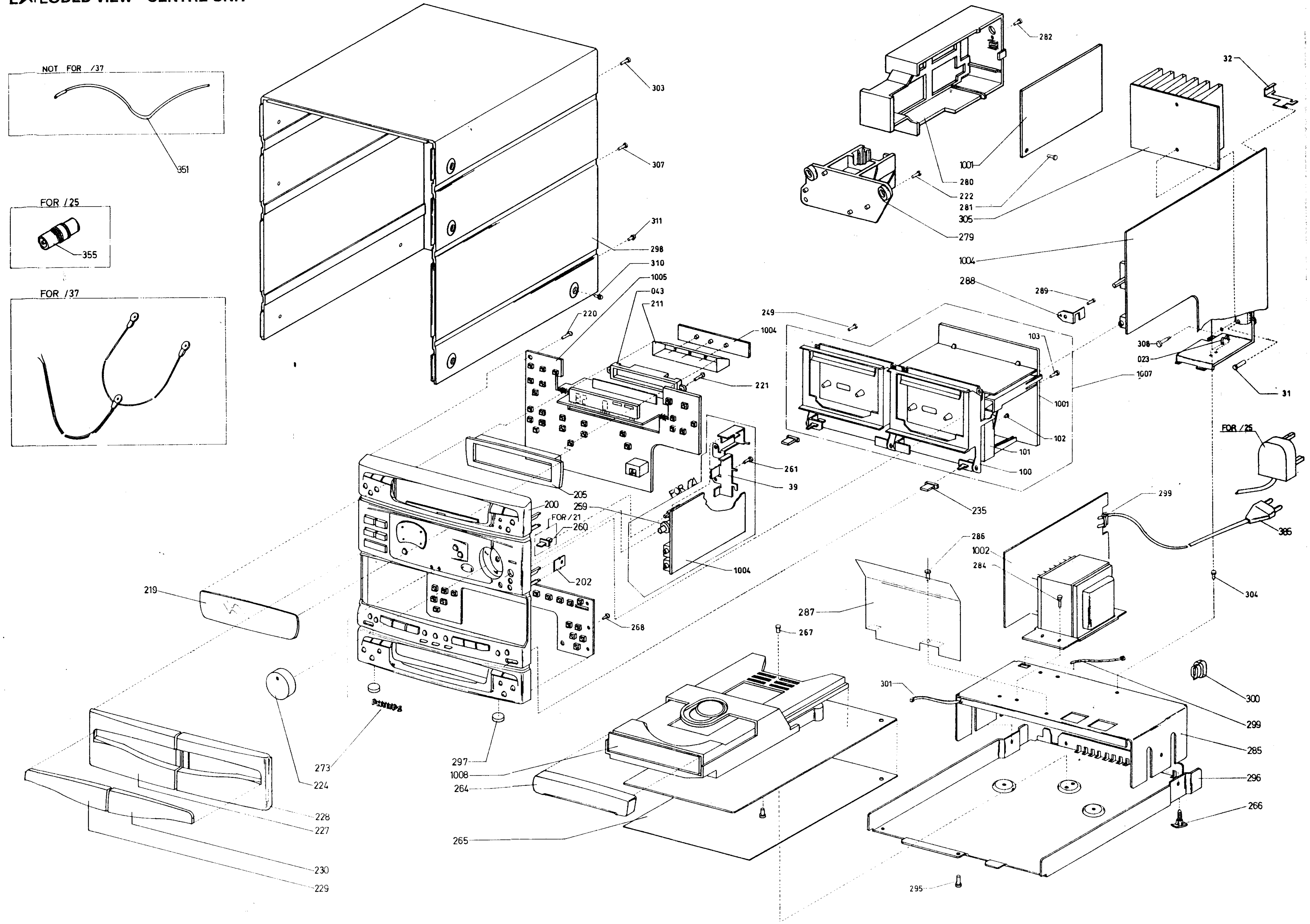
MECHANICAL PARTS - CD MECHANISM

86	4822 528 81464	Drive Pinion
87	4822 528 81465	Pulley
88	4822 325 60379	Damping Grommet
89	4822 276 13222	Switch
93	4822 444 60816	Cover Plate
96	4822 325 80511	Rubber support
101	4822 444 50679	Tray
102	4822 358 31168	Belt
103	4822 691 30278	CDM12
104	4822 325 50215	Suspension
108	4822 402 61412	Clamper Assy
109	4822 464 50895	Subchassis
110	4822 444 50678	Chassis
111	4822 361 21492	Motor

HAS.1078

Note: Only the parts mentioned in this list are normal service spare parts.

EXPLODED VIEW - CENTRE UNIT



NOT FOR /37
351
FOR /25
355
FOR /37
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043
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1004
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224
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1008
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289
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1001
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235
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12 - 9

12 - 10

SCREW

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220

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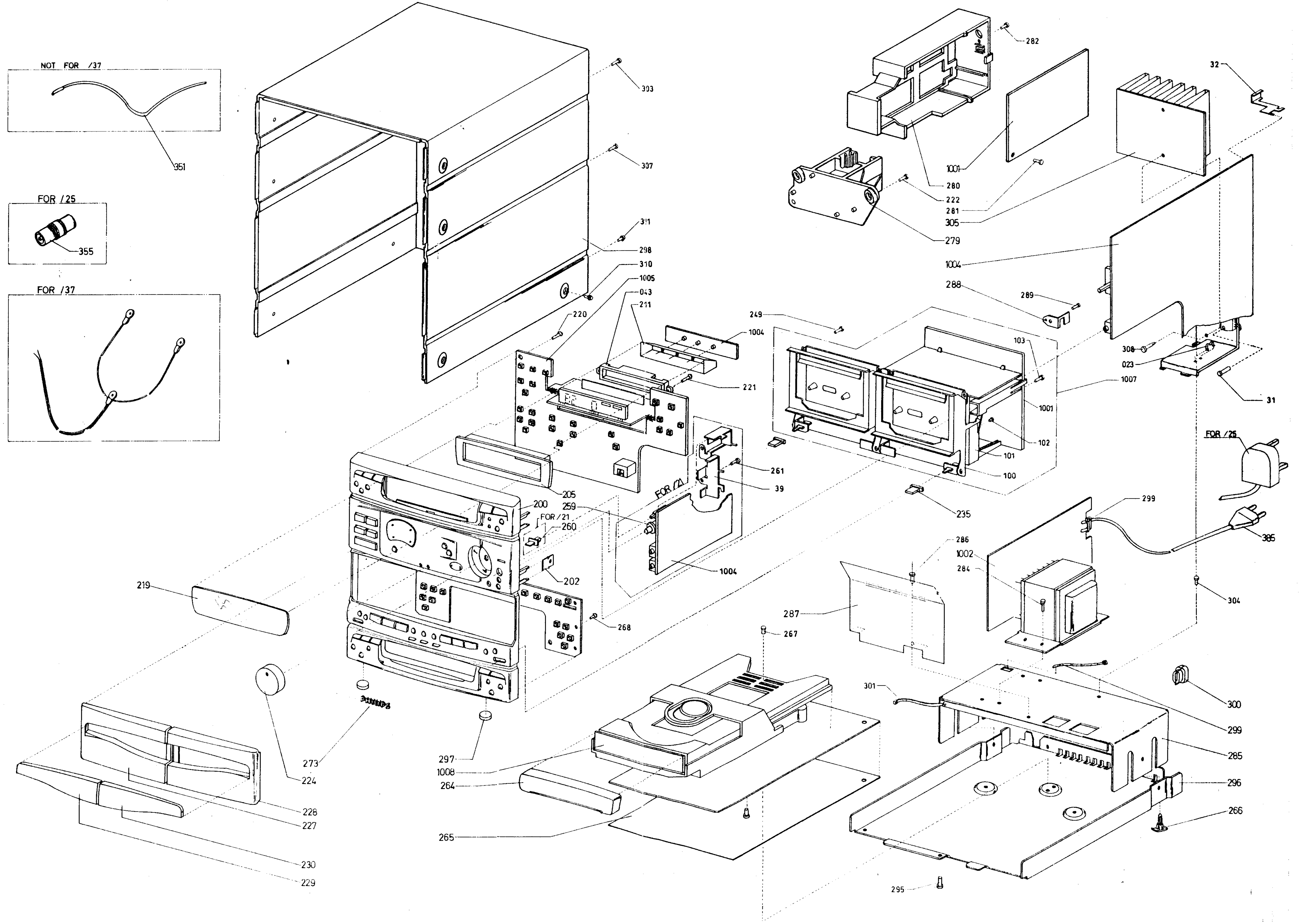
EXPLODED VIEW - CENTRE UNIT


NOT FOR /37
351
FOR /25
355
FOR /37
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FOR/21
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1001
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FOR /25
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1002
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SCREW

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ELECTRICAL PARTS - ECO4 MIDI BOARD (For all versions except /22)

MISCELLANEOUS

1101	4822 267 10283	Coaxial Socket 75Ω
1101	4822 265 20598	F-connector Coaxial 75Ω for USA version

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2100	4822 122 33195	100pF 10% 50V
2104	4822 122 33195	100pF 10% 50V
2107	4822 122 31746	1nF 2% 63V
2110	5322 122 32659	33pF 5% 50V for LW version
2110	5322 122 32269	6.8pF 5% 50V
2112	4822 122 33496	100nF 10% 63V
2114	5322 122 32531	100pF 5% 50V for LW version
2115	4822 125 60101	Trimmer 3-11pF 100V
2120	5322 122 32268	470pF 10% 50V
2121	5322 122 32481	15pF 5% 50V
2122	4822 122 31746	1nF 2% 63V
2123	4822 122 31746	1nF 2% 63V
2124	4822 121 51387	10nF 20% 16V
2129	4822 121 43705	390pF 1% 160V for LW version
2130	4822 125 50355	Trimmer 4-20pF 100V
2133	4822 122 33128	15nF 10% 63V for LW version
2134	4822 122 33197	1nF 10% 50V
2135	4822 121 70245	560pF 1% 160V
2138	5322 122 32659	33pF 5% 50V for 2-band version
2139	4822 122 33891	3.3nF 10% 63V for LW version
2141	4822 124 40244	2.2µF 20% 63V
2142	4822 124 40242	1µF 20% 63V
2143	4822 122 33325	470nF 16V
2144	4822 122 33325	470nF 16V
2145	4822 122 33496	100nF 10% 63V for LW version
2146	5322 122 33063	2.2pF 5% 50V for LW version
2147	4822 122 33177	10nF 20% 50V
2150	4822 124 40435	10µF 20% 50V
2151	4822 124 40435	10µF 20% 50V
2152	4822 122 33496	100nF 10% 63V
2154	4822 122 33177	10nF 20% 50V
2154	4822 122 33128	15nF 10% 63V for USA version
2155	4822 122 33177	10nF 20% 50V
2155	4822 122 33128	15nF 10% 63V for USA version
2156	5322 126 10181	100nF 25V
2157	5322 126 10181	100nF 25V
2158	4822 122 31768	180pF 2% 63V
2159	4822 122 31768	180pF 2% 63V
2160	4822 124 40242	1µF 20% 63V
2161	4822 124 40242	1µF 20% 63V
2162	4822 124 40242	1µF 20% 63V
2168	4822 122 33481	1.8nF 2% 63V
2169	5322 122 31863	330pF 5% 50V
2170	5322 126 10223	4.7nF 10% 63V
2171	5322 126 10223	4.7nF 10% 63V
2172	4822 124 41631	1.5µF 50V
2173	4822 124 40433	47µF 20% 25V
2174	5322 116 80853	560pF 5% 63V

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2175	5322 122 32531	100pF 5% 50V
2177	5322 126 10181	100nF 25V for LW version
2178	4822 122 33197	1nF 10% 50V
2179	4822 122 33195	100pF 10% 50V
2180	5322 122 31946	27pF 10% 50V
2181	4822 122 32139	12pF 2% 63V
2183	4822 122 33496	100nF 10% 63V
2184	4822 124 41584	100µF 20% 10V
2185	4822 122 33496	100nF 10% 63V
2186	4822 122 31746	1nF 2% 63V
2193	4822 122 33496	100nF 10% 63V

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3106	4822 051 20104	100k 5% 0.1W
3107	4822 051 20222	2k2 5% 0.1W for LW version
3108	4822 051 20104	100k 5% 0.1W
3109	4822 051 20222	2k2 5% 0.1W for LW version
3110	4822 051 20473	47k 5% 0.1W for LW version
3111	4822 051 20153	15k 5% 0.1W
3112	4822 051 20223	22k 5% 0.1W
3116	4822 051 20335	3M3 5% 0.1W for LW version
3119	4822 116 52224	470Ω 5% 0.5W
3120	4822 116 52289	5k6 5% 0.5W
3121	4822 051 20104	100k 5% 0.1W
3122	4822 051 20471	470Ω 5% 0.1W
3123	4822 051 20223	22k 5% 0.1W
3124	4822 116 52256	2k2 5% 0.5W for LW version
3125	4822 051 20472	4k7 5% 0.1W for LW version
3128	4822 117 10833	10k 1% 0.1W
3129	4822 051 20472	4k7 5% 0.1W for LW version
3132	4822 116 52283	4k7 5% 0.5W
3141	4822 116 52215	220Ω 5% 0.5W
3142	4822 051 20222	2k2 5% 0.1W
3144	4822 051 20473	47k 5% 0.1W
3147	4822 051 20184	180k 5% 0.1W
3148	4822 100 11163	Trimmer 100k 30% 0.2W
3149	4822 051 20563	56k 5% 0.1W
3151	4822 116 52243	1k5 5% 0.5W
3154	4822 051 20333	33k 5% 0.1W
3155	4822 051 20333	33k 5% 0.1W
3156	4822 116 52233	10k 5% 0.5W
3157	4822 051 20273	27k 5% 0.1W
3158	4822 051 20189	18Ω 5% 0.1W for LW version
3159	4822 051 20184	180k 5% 0.1W
3160	4822 051 20823	82k 5% 0.1W
3161	4822 051 20823	82k 5% 0.1W
3162	4822 050 11002	1k 1% 0.4W
3163	4822 050 11002	1k 1% 0 4W
3164	4822 116 52283	4k7 5% 0.5W
3165	4822 116 52283	4k7 5% 0.5W
3166	4822 051 20101	100Ω 5% 0.1W
3167	4822 051 20008	0Ω Chip Jumper 0805
3170	4822 116 52283	4k7 5% 0.5W
3171	4822 051 20101	100Ω 5% 0.1W
3172	4822 051 20472	4k7 5% 0.1W

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3173	4822 116 52244	15k 5% 0.5W
3174	4822 116 52233	10k 5% 0.5W
3175	4822 051 20104	100k 5% 0.1W
3176	4822 051 20104	100k 5% 0.1W
3177	4822 116 52233	10k 5% 0.5W for LW version
3178	4822 051 20332	3k3 5% 0.1W
3179	4822 051 20104	100k 5% 0.1W
3180	4822 051 20333	33k 5% 0.1W
3181	4822 116 52234	100k 5% 0.5W
3183	4822 051 20223	22k 5% 0.1W
3184	4822 051 20223	22k 5% 0.1W
3185	4822 051 20472	4k7 5% 0.1W
3186	4822 051 20183	18k 5% 0.1W
3188	4822 051 10102	1k 2% 0.25W
3189	4822 116 52249	1k8 5% 0.5W
3190	4822 116 52249	1k8 5% 0.5W
3191	4822 116 52249	1k8 5% 0.5W
3192	4822 116 52249	1k8 5% 0.5W
3193	4822 116 52256	2k2 5% 0.5W
3194	4822 050 24701	470Ω 1% 0.6W
3195	4822 050 24701	470Ω 1% 0.6W
3197	4822 050 24701	470Ω 1% 0.6W
3200	4822 051 20223	22k 5% 0.1W
3201	4822 116 52176	10Ω 5% 0.5W
3211	4822 051 10008	0Ω 5% 0.25W
3212	4822 051 10008	0Ω 5% 0.25W
3213	4822 051 10008	0Ω 5% 0.25W
3220	4822 051 20008	Chip Jumper 0805
3222	4822 051 20008	Chip Jumper 0805 for 2-band version
3223	4822 051 20008	Chip Jumper 0805 for LW version
3224	4822 051 20008	Chip Jumper 0805
3226	4822 051 20008	Chip Jumper 0805 for 2-band version
3228	4822 051 10008	0Ω 5% 0.25W
3229	4822 051 20008	Chip Jumper 0805 for 2-band version
3233	4822 051 20008	Chip Jumper 0805
3235	4822 051 10008	Chip Jumper 1206
3237	4822 051 10008	0Ω 5% 0.25W
3238	4822 051 20008	Chip Jumper 0805 for LW version
3240	4822 051 10008	0Ω 5% 0.25W
3241	4822 051 20008	Chip Jumper 0805 for 2-band version
3242	4822 051 10008	0Ω 5% 0.25W
3243	4822 051 20008	Chip Jumper 0805 for 2-band version
3244	4822 051 20008	Chip Jumper 0805
3245	4822 051 20008	Chip Jumper 0805 for 2-band version
3246	4822 051 10008	0Ω 5% 0.25W
3247	4822 051 10008	0Ω 5% 0.25W
3248	4822 051 20008	Chip Jumper 0805
3249	4822 051 20153	15k 5% 0.1W for LW version
3249	4822 051 20821	820Ω 5% 0.1W

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5105	4822 158 60641	Ferrite antenna MW/LW for LW version
5106	4822 158 60642	Ferrite antenna MW for 2-band version
5109	4822 156 30947	RF Coil 1.5T
5120	4822 156 30947	RF Coil 1.5T
5122	4822 157 60517	Coil 110µH 8% for LW version
5123	4822 157 60517	Coil 110µH 8%
5140	4822 158 60511	AM IF Coil 450kHz
5142	4822 157 70302	AM IF Coil 450kHz
5143	4822 242 70665	Ceramic Filter 10.7MHz
5144	4822 242 70665	Ceramic Filter 10.7MHz
5145	4822 242 81362	Ceramic Discriminator
5150	4822 157 50975	Coil 1mH 10%
5170	4822 242 72976	Ceramic Resonator 7.2MHz

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6105	4822 130 83075	HN1V02H
6109	4822 130 82833	1SV228
6121	4822 130 30621	1N4148 (refer to circuit)
6122	4822 130 30621	1N4148 (refer to circuit)
6123	4822 130 30621	1N4148 (refer to circuit)
6124	4822 130 82833	1SV228
6140	4822 130 30621	1N4148
6154	4822 130 30621	1N4148
6174	4822 130 34233	BZX79-B5V1

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7102	5322 130 42136	BC848C for LW version
7104	5322 130 42136	BC848C for LW version
7105	4822 130 60093	2SA838B
7120	4822 130 60163	2SC1047
7121	5322 130 42136	BC848C for LW version
7123	5322 130 42136	BC848C for LW version
7128	5322 130 42136	BC848C for LW version
7140	4822 209 32701	TEA5712T/N2 (RF IC)
7150	5322 209 14482	HEF4096UBT (6 x Inverter)
7152	5322 130 41983	BC858B for LW version
7156	4822 130 41344	BC337-40
7157	4822 130 41344	BC337-40
7169	5322 130 42136	BC848C
7170	5322 130 42136	BC848C
7171	5322 130 42136	BC848C
7172	5322 209 11517	MM74HCU04M (6 x Inverter)
7173	4822 209 31998	LC7218M (Synthesizer)
7174	5322 130 41983	BC858B
7178	5322 130 41983	BC858B
7179	5322 130 42136	BC848C for LW version

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PART

MISC

1101	4822 2
1110	4822 2

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2101	5322 1
2102	5322 1
2103	4822 1
2104	4822 1
2105	5322 1
2107	4822 1
2108	5322 1
2109	5322 1
2110	5322 1
2112	5322 1
2113	5322 1
2114	5322 1
2115	4822 1
2116	5322 1
2117	4822 1
2118	4822 1
2119	4822 1
2120	4822 1
2121	4822 1
2123	4822 1
2124	4822 1
2125	4822 1
2126	4822 1
2129	4822 1
2131	4822 1
2142	4822 1
2144	4822 1
2145	4822 1
2146	4822 1
2147	5322 1
2148	5322 1
2149	4822 1
2150	5322 1
2151	5322 1
2152	4822 1
2153	5322 1
2154	5322 1
2155	5322 1
2156	4822 1
2158	5322 1
2159	5322 1
2160	4822 1
2161	4822 1
2162	4822 1
2165	4822 1
2193	4822 1
2194	4822 1

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3173	**4822 116 52244**	**15k 5% 0.5W**
3174	**4822 116 52233**	**10k 5% 0.5W**
3175	**4822 051 20104**	**100k 5% 0.1W**
3176	**4822 051 20104**	**100k 5% 0.1W**
3177	**4822 116 52233**	**10k 5% 0.5W** **for LW version**
3178	**4822 051 20332**	**3k3 5% 0.1W**
3179	**4822 051 20104**	**100k 5% 0.1W**
3180	**4822 051 20333**	**33k 5% 0.1W**
3181	4822 116 52234	100k 5% 0.5W
3183	4822 051 20223	22k 5% 0.1W
3184	4822 051 20223	22k 5% 0.1W
3185	4822 051 20472	4k7 5% 0.1W
3186	4822 051 20183	18k 5% 0.1W
3188	4822 051 10102	1k 2% 0.25W
3189	4822 116 52249	1k8 5% 0.5W
3190	4822 116 52249	1k8 5% 0.5W
3191	4822 116 52249	1k8 5% 0.5W
3192	4822 116 52249	1k8 5% 0.5W
3193	4822 116 52256	2k2 5% 0.5W
3194	4822 050 24701	470Ω 1% 0.6W
3195	4822 050 24701	470Ω 1% 0.6W
3197	4822 050 24701	470Ω 1% 0.6W
3200	4822 051 20223	22k 5% 0.1W
3201	4822 116 52176	10Ω 5% 0.5W
3211	4822 051 10008	0Ω 5% 0.25W
3212	4822 051 10008	0Ω 5% 0.25W
3213	4822 051 10008	0Ω 5% 0.25W
3220	4822 051 20008	Chip Jumper 0805
3222	4822 051 20008	Chip Jumper 0805 for 2-band version
3223	4822 051 20008	Chip Jumper 0805 for LW version
3224	4822 051 20008	Chip Jumper 0805
3226	4822 051 20008	Chip Jumper 0805 for 2-band version
3228	4822 051 10008	0Ω 5% 0.25W
3229	4822 051 20008	Chip Jumper 0805 for 2-band version
3233	4822 051 20008	Chip Jumper 0805
3235	4822 051 10008	Chip Jumper 1206
3237	4822 051 10008	0Ω 5% 0.25W
3238	4822 051 20008	Chip Jumper 0805 for LW version
3240	4822 051 10008	0Ω 5% 0.25W
3241	4822 051 20008	Chip Jumper 0805 for 2-band version
3242	4822 051 10008	0Ω 5% 0.25W
3243	4822 051 20008	Chip Jumper 0805 for 2-band version
3244	4822 051 20008	Chip Jumper 0805
3245	4822 051 20008	Chip Jumper 0805 for 2-band version
3246	4822 051 10008	0Ω 5% 0.25W
3247	4822 051 10008	0Ω 5% 0.25W
3248	4822 051 20008	Chip Jumper 0805
3249	4822 051 20153	15k 5% 0.1W for LW version
3249	4822 051 20821	820Ω 5% 0.1W

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5105	**4822 158 60641**	**Ferrite antenna MW/LW** **for LW version**
5106	**4822 158 60642**	**Ferrite antenna MW** **for 2-band version**
5109	4822 156 30947	RF Coil 1.5T
5120	4822 156 30947	RF Coil 1.5T
5122	4822 157 60517	Coil 110µH 8% for LW version
5123	4822 157 60517	Coil 110µH 8%
5140	4822 158 60511	AM IF Coil 450kHz
5142	4822 157 70302	AM IF Coil 450kHz
5143	4822 242 70665	Ceramic Filter 10.7MHz
5144	4822 242 70665	Ceramic Filter 10.7MHz
5145	4822 242 81362	Ceramic Discriminator
5150	4822 157 50975	Coil 1mH 10%
5170	4822 242 72976	Ceramic Resonator 7.2MHz

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6105	4822 130 83075	HN1V02H
6109	4822 130 82833	1SV228
6121	4822 130 30621	1N4148 (refer to circuit)
6122	4822 130 30621	1N4148 (refer to circuit)
6123	4822 130 30621	1N4148 (refer to circuit)
6124	4822 130 82833	1SV228
6140	4822 130 30621	1N4148
6154	4822 130 30621	1N4148
6174	4822 130 34233	BZX79-B5V1

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7102	5322 130 42136	BC848C for LW version
7104	5322 130 42136	BC848C for LW version
7105	4822 130 60093	2SA838B
7120	4822 130 60163	2SC1047
7121	5322 130 42136	BC848C for LW version
7123	5322 130 42136	BC848C for LW version
7128	5322 130 42136	BC848C for LW version
7140	4822 209 32701	TEA5712T/N2 (RF IC)
7150	5322 209 14482	HEF4096UBT (6 x Inverter)
7152	5322 130 41983	BC858B for LW version
7156	4822 130 41344	BC337-40
7157	4822 130 41344	BC337-40
7169	5322 130 42136	BC848C
7170	5322 130 42136	BC848C
7171	5322 130 42136	BC848C
7172	5322 209 11517	MM74HCU04M (6 x Inverter)
7173	4822 209 31998	LC7218M (Synthesizer)
7174	5322 130 41983	BC858B
7178	5322 130 41983	BC858B
7179	5322 130 42136	BC848C for LW version

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - TUNER 92 BOARD (For /22 only)

MISCELLANEOUS

1101	4822 210 10492	Tuner Unit FE415-G11
1110	4822 267 10283	FM Antenna Socket

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2101	5322 122 34099	470pF 10% 63V
2102	5322 122 32268	470pF 10% 50V
2103	4822 124 40433	47µF 20% 25V
2104	4822 121 42408	220nF 5% 63V
2105	5322 122 32965	18pF 5% 50V
2107	4822 122 31385	22pF 50V
2108	5322 122 32654	22nF 10% 63V
2109	5322 122 32654	22nF 10% 63V
2110	5322 122 32654	22nF 10% 63V
2112	5322 122 32654	22nF 10% 63V
2113	5322 122 32661	56pF 5% 50V
2114	5322 124 41431	22µF 20% 35V
2115	4822 124 40239	0.47µF 20% 63V
2116	5322 121 42386	100nF 5% 63V
2117	4822 121 41935	12nF 5% 250V
2118	4822 121 41935	12nF 5% 250V
2119	4822 124 40244	2.2µF 20% 63V
2120	4822 124 40244	2.2µF 20% 63V
2121	4822 124 40196	220µF 20% 16V
2123	4822 124 40246	4.7µF 20% 63V
2124	4822 124 40246	4.7µF 20% 63V
2125	4822 122 33177	10nF 20% 50V
2126	4822 122 31782	1.5nF 10% 50V
2129	4822 124 40242	1µF 20% 63V
2131	4822 124 40435	10µF 20% 50V
2142	4822 125 60102	Trimmer 30pF
2144	4822 121 42408	220nF 5% 63V
2145	4822 121 51263	510pF 1% 400V
2146	4822 121 70082	430pF 1% 400V
2147	5322 122 32654	22nF 10% 63V
2148	5322 122 32452	47pF 5% 63V
2149	4822 122 33177	10nF 20% 50V
2150	5322 122 32654	22nF 10% 63V
2151	5322 122 34099	470pF 10% 63V
2152	4822 124 40242	1µF 20% 63V
2153	5322 122 34099	470pF 10% 63V
2154	5322 122 32481	15pF 5% 50V
2155	5322 122 32965	18pF 5% 50V
2156	4822 124 40433	47µF 20% 25V
2158	5322 126 10223	4.7nF 10% 63V
2159	5322 126 10223	4.7nF 10% 63V
2160	4822 124 41631	1.5µF 50V
2161	4822 122 32927	220nF +80-20% 50V
2162	4822 122 10166	22nF 30% 16V
2165	4822 124 40433	47µF 20% 25V
2193	4822 125 60102	Trimmer 5.2-30pF
2194	4822 125 60101	Trimmer 3-11pF

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2195	5322 122 33861	120pF 5%
2196	5322 122 32448	10pF 5% 50V
2210	4822 124 41643	100µF 20% 16V
2215	5322 122 32268	470pF 10% 50V
2216	5322 122 32268	470pF 10% 50V
2219	4822 122 32927	220nF +80-20% 50V
2221	5322 122 32268	470pF 10% 50V
2224	4822 122 31173	220pF 10% 500V
2225	4822 122 31173	220pF 10% 500V

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3101	4822 052 10478	⚠	4Ω7 5% 0.33W
3102	4822 051 20224		220k 5% 0.1W
3104	4822 051 20154		150k 5% 0.1W
3105	4822 051 20562		5k6 5% 0.1W
3106	4822 051 20829		82Ω 5% 0.1W
3107	4822 051 20104		100k 5% 0.1W
3108	4822 116 52224		470Ω 5% 1/6W
3113	4822 050 22201	⚠	220Ω 1% 1/6W
3114	4822 051 20332		3k3 5% 0.1W
3115	4822 051 20391		390Ω 5% 0.1W
3116	4822 051 20478		4Ω7 5% 0.1W
3117	4822 051 20331		330Ω 5% 0.1W
3118	4822 116 52215	⚠	220Ω 5% 0.5W
3120	4822 052 10229	⚠	22Ω 5%
3121	4822 051 20272		2k7 5% 0.1W
3122	4822 051 20562		5k6 5% 0.1W
3123	4822 051 20223		22k 5% 0.1W
3124	4822 051 20103		10k 5% 0.1W
3125	4822 100 11213		Trimmer 22k 30%
3126	4822 051 20123		12k 5% 0.1W
3127	4822 051 20562		5k6 5% 0.1W
3128	4822 051 20562		5k6 5% 0.1W
3129	4822 051 20103		10k 5% 0.1W
3131	4822 100 11319		Trimmer 4k7
3132	4822 051 20183		18k 5% 0.1W
3133	4822 051 20008		Chip Jumper 0805
3134	4822 050 15602		5k6 1% 0.4W
3135	4822 051 10008		0Ω 5% 0.25W
3138	4822 116 83922	⚠	150Ω 5% 1W
3141	4822 051 20472		4k7 5% 0.1W
3142	4822 051 20472		4k7 5% 0.1W
3143	4822 051 20821		820Ω 5% 0.1W
3144	4822 051 20331		330Ω 5% 0.1W
3145	4822 051 20271		270Ω 5% 0.1W
3147	4822 050 15602		5k6 1% 0.4W
3148	4822 051 20104		100k 5% 0.1W
3149	4822 051 20472		4k7 5% 0.1W
3150	4822 050 25601		560Ω 1% 0.6W
3151	4822 050 24702		4k7 1% 0.6W
3152	4822 051 20103		10k 5% 0.1W

ELECTRICAL PARTS - TUNER 92 BOARD (For /22 only)

3153	4822 051 20274		270k 5% 0.1W
3155	4822 050 22201	⚠	220Ω 1% 0.6W
3156	4822 051 20153		15k 5% 0.1W
3157	4822 051 20472		4k7 5% 0.1W
3158	4822 050 24702		4k7 1% 0.6W
3159	4822 051 20104		100k 5% 0.1W
3160	4822 051 20104		100k 5% 0.1W
3162	4822 050 22701	⚠	270Ω 1%
3163	4822 051 20103		10k 5% 0.1W
3164	4822 051 20473		47k 5% 0.1W
3165	4822 050 21002		1k 1% 0.6W
3166	4822 050 21002		1k 1% 0.6W
3167	4822 050 21002		1k 1% 0.6W
3170	4822 051 20103		10k 5% 0.1W
3171	4822 051 20223		22k 5% 0.1W
3172	4822 051 20472		4k7 5% 0.1W
3173	4822 051 20223		22k 5% 0.1W
3183	4822 050 21003		10k 1% 0.6W
3184	4822 051 20332		3k3 5% 0.1W
3185	4822 051 20103		10k 5% 0.1W
3186	4822 050 21003		10k 1% 0.6W
3187	4822 051 20103		10k 5% 0.1W
3190	4822 051 20479		47Ω 5% 0.1W
3194	4822 051 20472		4k7 5% 0.1W
3196	4822 051 20008		Chip Jumper 0805
3197	4822 051 20008		Chip Jumper 0805
3198	4822 051 20103		10k 5% 0.1W
3200	4822 051 20008		Chip Jumper 0805
3201	4822 051 20103		10k 5% 0.1W
3202	4822 051 20008		Chip Jumper 0805
3223	4822 051 20474		470k 5% 0.1W
3225	4822 050 21002		1k 1% 0.6W
3230	4822 051 20223		22k 5% 0.1W
3231	4822 051 20223		22k 5% 0.1W
3233	4822 051 10102		1k 2% 0.25W
3236	4822 051 20008		Chip Jumper 0805
3239	4822 051 20274		270k 5% 0.1W
3240	4822 051 20472		4k7 5% 0.1W
3244	5322 116 44005		PTC 250Ω 25V

5101	4822 157 53192	Coil 0.22µH 20%
5103	4822 242 81249	Ceramic Filter 10.7MHz
5104	4822 157 63029	IFT AM Coil
5105	4822 157 63904	FM Detector Coil
5106	4822 157 63802	Birdy Filter
5108	4822 157 63912	AM Osc Coil
5110	4822 242 71878	Ceramic Filter 450kHz
5111	4822 242 81248	Ceramic Resonator 19kHz
5112	4822 242 72976	X'tal Resonator 7.2MHz
5113	4822 242 81249	Ceramic Filter 10.7MHz

5114	4822 152 20699	Inductor 560µH
5127	4822 158 60643	Ferroceptor

6101	4822 130 34174	BZX79-C4V7
6102	4822 130 83075	HN1V02H
6109	4822 130 30621	1N4148
6121	4822 130 30621	1N4148 (refer to circuit)
6122	4822 130 30621	1N4148 (refer to circuit)
6123	4822 130 30621	1N4148 (refer to circuit)

7101	4822 130 60163	2SC1047
7103	4822 209 31001	LA1851N
7104	5322 130 60068	BC558C
7105	4822 209 30178	LC7218
7106	5322 130 60068	BC558C
7107	5322 130 41982	BC848B
7108	4822 130 44196	BC548C
7109	4822 130 44196	BC548C
7111	5322 130 41982	BC848B
7112	4822 130 60163	2SC1047
7113	4822 130 44196	BC548C
7114	4822 130 40937	BC548B
7115	4822 130 41024	BF245B
7116	4822 130 60163	2SC1047
7119	5322 130 41983	BC858B
7120	4822 130 44196	BC548C
7150	5322 130 44779	BC338-40
7151	4822 130 60163	2SC1047
7157	5322 130 44779	BC338-40

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - CD BOARD

MISCELLANEOUS

1002	4822 242 73557		Ceramic Resonator 8.46MHz
1020	4822 071 51601	⚠	Fuse T160mA 250V
1021	4822 071 51601	⚠	Fuse T160mA 250V
1570	4822 242 80997		Resonator 16.93MHz
1700	4822 242 72527		Ceramic Resonator 4MHz

2000	5322 122 31865	1.5nF 10% 63V
2001	5322 116 80853	560pF 5% 63V
2003	4822 122 31173	220pF 10% 500V
2004	4822 122 31173	220pF 10% 500V
2005	4822 122 31173	220pF 10% 500V
2006	4822 122 31173	220pF 10% 500V
2007	4822 122 31173	220pF 10% 500V
2008	4822 122 31173	220pF 10% 500V
2009	4822 122 33496	100nF 10% 63V
2010	5322 124 21643	22µF 20% 40V
2011	4822 122 33496	100nF 10% 63V
2012	4822 124 40272	33µF 20% 16V
2015	5322 124 21643	22µF 20% 40V
2016	4822 122 33496	100nF 10% 63V
2018	4822 122 33496	100nF 10% 63V
2019	4822 122 33809	22nF 20% 50V
2040	5322 122 32654	22nF 10% 63V
2041	4822 126 10326	180pF 5% 63V
2042	5322 124 21643	22µF 20% 40V
2043	5322 122 31863	330pF 5% 50V
2044	4822 126 10326	180pF 5% 63V
2045	5322 122 32452	47pF 5% 63V
2046	5322 122 32452	47pF 5% 63V
2047	5322 122 32531	100pF 5% 50V
2048	5322 122 32965	18pF 5% 50V
2049	4822 126 10326	180pF 5% 63V
2050	4822 126 10326	180pF 5% 63V
2051	5322 122 31863	330pF 5% 50V
2052	5322 124 21643	22µF 20% 40V
2060	4822 122 32542	47nF 10% 63V
2061	4822 122 33496	100nF 10% 63V
2064	4822 122 33342	33nF 10% 63V
2065	4822 122 32542	47nF 10% 63V
2066	4822 122 33175	2.2nF 20% 50V
2070	4822 122 32627	2.7nF 10% 50V
2071	4822 122 33496	100nF 10% 63V
2072	4822 126 10326	180pF 5% 63V
2080	4822 122 33496	100nF 10% 63V
2082	4822 122 33496	100nF 10% 63V
2084	4822 126 10326	180pF 5% 63V
2085	4822 122 33496	100nF 10% 63V
2086	5322 126 10465	3.9nF 10% 63V
2101	5322 122 32452	47pF 5% 63V
2102	4822 122 33175	2.2nF 20% 50V
2103	4822 124 40849	330µF 20% 16V
2104	4822 122 33496	100nF 10% 63V
2105	5322 121 42661	330nF 5% 63V
2106	4822 122 33496	100nF 10% 63V
2107	4822 124 41584	100µF 20% 10V
2108	4822 122 33809	22nF 20% 50V
2109	4822 124 40242	1µF 20% 63V
2110	5322 122 32659	33pF 5% 50V
2111	5322 121 42386	100nF 5% 63V
2112	4822 122 33496	100nF 10% 63V
2116	4822 124 40242	1µF 20% 63V
2117	5322 126 10223	4.7nF 10% 63V
2118	5322 126 10223	4.7nF 10% 63V
2119	4822 124 41584	100µF 20% 10V
2120	4822 122 33496	100nF 10% 63V
2121	4822 122 33496	100nF 10% 63V
2122	4822 124 40849	330µF 20% 16V
2123	4822 122 33496	100nF 10% 63V
2140	4822 122 33496	100nF 10% 63V
2141	4822 122 32542	47nF 10% 63V
2300	5322 122 31863	330pF 5% 50V
2301	4822 124 40433	47µF 20% 25V
2302	4822 124 40246	4.7µF 20% 63V
2303	4822 122 33216	270pF 5% 50V
2304	4822 124 40272	33µF 20% 16V
2306	4822 122 33496	100nF 10% 63V
2309	4822 122 33216	270pF 5% 50V
2310	5322 122 31863	330pF 5% 50V
2311	4822 124 40246	4.7µF 20% 63V
2312	4822 122 33219	1.8nF 10% 50V
2313	4822 122 33219	1.8nF 10% 50V
2500	4822 124 40201	1000µF 20% 16V
2501	4822 122 33496	100nF 10% 63V
2502	4822 124 41853	1000µF 16V
2503	4822 122 32542	47nF 10% 63V
2504	4822 122 32542	47nF 10% 63V
2550	4822 122 33175	2.2nF 20% 50V
2610	4822 122 32542	47nF 10% 63V
2611	4822 122 32542	47nF 10% 63V
2612	4822 122 33496	100nF 10% 63V
2702	4822 124 40272	33µF 20% 16V
2703	4822 122 33809	22nF 20% 50V
2704	4822 122 33175	2.2nF 20% 50V

3000	4822 050 21003	10k 1% 0.6W
3001	4822 050 21003	10k 1% 0.6W
3002	4822 050 21003	10k 1% 0.6W
3003	4822 050 21003	10k 1% 0.6W
3004	4822 050 21003	10k 1% 0.6W

ELECTRICAL PARTS - CD BOARD

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3005	4822 050 21003	10k 1% 0.6W
3006	4822 051 20103	10k 5% 0.1W
3007	4822 052 10338 △	3Ω3 5% 0.33W
3008	4822 052 10338 △	3Ω3 5% 0.33W
3009	4822 051 20105	1M 5% 0.1W
3010	4822 051 20103	10k 5% 0.1W
3011	4822 051 20103	10k 5% 0.1W
3012	4822 051 10102	1k 2% 0.25W
3013	4822 051 10102	1k 2% 0.25W
3014	4822 052 10478 △	4Ω7 5% 0.33W
3015	4822 050 21002	1k 1% 0.6W
3016	4822 050 21002	1k 1% 0.6W
3017	4822 051 10102	1k 2% 0.25W
3040	4822 051 10101	100Ω 2% 0.25W
3041	4822 051 20393	39k 5% 0.1W
3042	4822 051 20334	330k 5% 0.1W
3043	4822 051 20303	30k 5% 0.1W
3044	4822 051 10102	1k 2% 0.25W
3045	4822 051 20101	100Ω 5% 0.1W
3046	4822 051 10102	1k 2% 0.25W
3047	4822 051 20431	430Ω 5% 0.1W
3048	4822 051 20101	100Ω 5% 0.1W
3049	4822 050 24301	430Ω 1% 0.6W
3050	4822 051 20431	430Ω 5% 0.1W
3051	4822 051 20182	1k8 5% 0.1W
3052	4822 051 20182	1k8 5% 0.1W
3053	4822 051 20392	3k9 5% 0.1W
3054	4822 051 20101	100Ω 5% 0.1W
3055	4822 051 20124	120k 5% 0.1W
3056	4822 050 21204	120k 1% 0.6W
3057	4822 050 25603	56k 1% 0.6W
3058	4822 050 21002	1k 1% 0.6W
3060	4822 117 10036	7k5 1% 0.1W
3061	4822 051 20682	6k8 5% 0.1W
3062	4822 116 52244	15k 5% 0.5W
3063	4822 051 20103	10k 5% 0.1W
3064	4822 050 21503	15k 1% 0.125W
3065	4822 052 10229 △	22Ω 5% 0.33W
3066	4822 052 10108 △	1Ω 5% 0.33W
3067	4822 052 10108 △	1Ω 5% 0.33W
3070	4822 051 20153	15k 5% 0.1W
3071	4822 051 20103	10k 5% 0.1W
3072	4822 050 26802	6k8 1% 0.6W
3073	4822 052 10229 △	22Ω 5% 0.33W
3074	4822 116 52244	15k 5% 0.5W
3075	4822 050 21003	10k 1% 0.6W
3080	4822 051 20682	6k8 5% 0.1W
3081	4822 050 24702	4k7 1% 0.6W
3082	4822 051 20153	15k 5% 0.1W
3085	4822 050 21003	10k 1% 0.6W
3086	4822 052 10229 △	22Ω 5% 0.33W
3087	4822 116 52244	15k 5% 0.5W

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3100	4822 050 22202	2k2 1% 0.6W
3101	4822 051 20223	22k 5% 0.1W
3102	4822 051 20223	22k 5% 0.1W
3103	4822 052 10338 △	3Ω3 5% 0.33W
3105	4822 052 10338 △	3Ω3 5% 0.33W
3106	4822 051 10102	1k 2% 0.25W
3109	4822 051 20222	2k2 5% 0.1W
3110	4822 051 20224	220k 5% 0.1W
3111	4822 052 10229 △	22Ω 5% 0.33W
3112	4822 050 22205	2M2 1% 0.6W
3117	4822 051 20182	1k8 5% 0.1W
3118	4822 051 20182	1k8 5% 0.1W
3119	4822 051 10561	560Ω 2% 0.25W
3140	4822 116 52234	100k 5% 0.5W
3141	4822 051 20104	100k 5% 0.1W
3142	4822 050 24703	47k 1% 0.6W
3143	4822 052 10229 △	22Ω 5% 0.33W
3144	4822 051 20223	22k 5% 0.1W
3146	4822 050 21003	10k 1% 0.6W
3147	4822 051 20392	3k9 5% 0.1W
3148	4822 051 20473	47k 5% 0.1W
3300	4822 051 20223	22k 5% 0.1W
3301	4822 051 20153	15k 5% 0.1W
3302	4822 051 20332	3k3 5% 0.1W
3303	4822 050 21803	18k 1% 0.6W
3304	4822 051 20123	12k 5% 0.1W
3305	4822 052 10229 △	22Ω 5% 0.33W
3306	4822 052 10229 △	22Ω 5% 0.33W
3307	4822 051 20332	3k3 5% 0.1W
3308	4822 051 20123	12k 5% 0.1W
3309	4822 051 20223	22k 5% 0.1W
3310	4822 051 20153	15k 5% 0.1W
3311	4822 051 20183	18k 5% 0.1W
3312	4822 050 22203	22k 1% 0.6W
3313	4822 051 20223	22k 5% 0.1W
3314	4822 050 21002	1k 1% 0.6W
3315	4822 050 21002	1k 1% 0.6W
3320	4822 116 83933	15k 1% 0.1W
3321	4822 116 83933	15k 1% 0.1W
3322	4822 116 83933	15k 1% 0.1W
3323	4822 116 83933	15k 1% 0.1W
3325	4822 116 83933	15k 1% 0.1W
3326	4822 116 83933	15k 1% 0.1W
3327	4822 116 83933	15k 1% 0.1W
3328	4822 116 83933	15k 1% 0.1W
3501	4822 052 10108 △	1Ω 5% 0.33W
3502	4822 052 10108 △	1Ω 5% 0.33W
3550	4822 051 20561	560Ω 5% 0.1W
3551	4822 051 10102	1k 2% 0.25W
3552	4822 051 20223	22k 5% 0.1W
3553	4822 051 10102	1k 2% 0.25W
3610	4822 051 20123	12k 5% 0.1W

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3611	4822 116 52303	8k2 5% 0.5W
3612	4822 051 20123	12k 5% 0.1W
3613	4822 051 20123	12k 5% 0.1W
3614	4822 051 20123	12k 5% 0.1W
3615	4822 052 10108 △	1Ω 5% 0.33W
3616	4822 052 10108 △	1Ω 5% 0.33W
3617	4822 052 10229 △	22Ω 5% 0.33W
3700	4822 051 20224	220k 5% 0.1W
3701	4822 052 10338 △	3Ω3 5% 0.33W
3706	4822 051 20103	10k 5% 0.1W
3707	4822 051 20103	10k 5% 0.1W
3708	4822 051 20103	10k 5% 0.1W
3710	4822 051 20103	10k 5% 0.1W
3711	4822 051 20332	3k3 5% 0.1W
3713	4822 051 20103	10k 5% 0.1W
3714	4822 051 20103	10k 5% 0.1W
3715	4822 051 20332	3k3 5% 0.1W
3716	4822 051 20103	10k 5% 0.1W
3717	4822 051 20103	10k 5% 0.1W
3718	4822 051 20103	10k 5% 0.1W
3719	4822 051 20103	10k 5% 0.1W
3720	4822 051 20103	10k 5% 0.1W
3721	4822 051 20103	10k 5% 0.1W
3722	4822 051 10102	1k 2% 0.25W
3723	4822 051 10102	1k 2% 0.25W
3724	4822 051 10102	1k 2% 0.25W
4000	4822 051 10008	0Ω 5% 0.25W
4001	4822 051 10008	0Ω 5% 0.25W
4002	4822 051 10008	0Ω 5% 0.25W
4003	4822 051 10008	0Ω 5% 0.25W
4004	4822 051 10008	0Ω 5% 0.25W
4104	4822 051 10008	0Ω 5% 0.25W
4105	4822 051 10008	0Ω 5% 0.25W
4106	4822 051 10008	0Ω 5% 0.25W
4107	4822 051 10008	0Ω 5% 0.25W
4108	4822 051 10008	0Ω 5% 0.25W
4109	4822 051 10008	0Ω 5% 0.25W
4200	4822 051 10008	0Ω 5% 0.25W
4302	4822 051 10008	0Ω 5% 0.25W
4600	4822 051 10008	0Ω 5% 0.25W
4701	4822 051 10008	0Ω 5% 0.25W

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6103	4822 130 30621	1N4148
6550	4822 130 31981	BZX79-C3V9

Ⓚ ▭

7000	4822 209 31064	TDA1301T/N1
7040	4822 130 60887	BF840

Ⓚ ▭

7041	5322 130 41982	BC848B
7042	5322 130 41983	BC858B
7043	5322 130 41982	BC848B
7044	5322 130 41982	BC848B
7060	4822 209 72587	TCA0372DP2
7080	4822 209 72587	TCA0372DP2
7101	4822 209 32036	UM6264BM-10L
7102	4822 209 30388	SAA7341GP
7140	5322 130 42012	BC858
7141	4822 130 61207	BC848
7300	4822 209 83274	NJM4560D
7301	4822 209 83274	NJM4560D
7500	4822 209 80891 △	MC78M05CT
7550	5322 130 42012	BC858
7660	4822 209 72587	TCA0372DP2
7700	4822 900 10318	MC68HC05C8/ SERVO-S22

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - FRONT BOARD

MISCELLANEOUS

1401	4822 130 91324	LCD Display FW46
1410	4822 276 13114	Tact Switch
1411	4822 276 13114	Tact Switch
1412	4822 276 13114	Tact Switch
1413	4822 276 13114	Tact Switch
1414	4822 276 13114	Tact Switch
1415	4822 276 13114	Tact Switch
1416	4822 276 13114	Tact Switch
1417	4822 276 13114	Tact Switch
1418	4822 276 13114	Tact Switch
1419	4822 276 13114	Tact Switch
1420	4822 276 13114	Tact Switch
1421	4822 276 13114	Tact Switch
1422	4822 276 13114	Tact Switch
1423	4822 276 13114	Tact Switch
1424	4822 276 13114	Tact Switch
1425	4822 276 13114	Tact Switch
1426	4822 276 13114	Tact Switch
1428	4822 276 13114	Tact Switch
1429	4822 276 13114	Tact Switch
1430	4822 276 13114	Tact Switch
1431	4822 276 13114	Tact Switch
1432	4822 276 13114	Tact Switch
1433	4822 276 13114	Tact Switch
1434	4822 276 13114	Tact Switch

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2401	4822 124 41584	100µF 20% 10V
2402	4822 124 80211	22mF 20% 5.5V
2403	4822 124 23176	22µF 20% 16V
2405	4822 126 11585	22nF +80-20% 25V
2410	4822 124 23179	10µF 20% 16V
2411	4822 126 12333	100nF 20% 25V
2413	4822 122 33191	22pF 5% 50V
2414	4822 122 33191	22pF 5% 50V
2415	4822 121 51387	10nF 20% 16V
2417	4822 122 33849	150pF 10% 50V
2418	4822 122 33849	150pF 10% 50V
2424	4822 126 12787	330pF 10% 50V
2425	4822 122 10466	220pF 10% 50V
2427	4822 126 12145	47nF 10% 25V
2470	4822 124 40248	10µF 20% 63V
2471	4822 124 40248	10µF 20% 63V
2472	4822 122 10577	3.3nF 10% 16V
2473	4822 122 33195	100pF 10% 50V
2475	4822 126 12145	47nF 10% 25V
2476	4822 126 12145	47nF 10% 25V
2477	4822 126 12145	47nF 10% 25V

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3402	4822 116 52228	680Ω 5% 0.5W
3403	4822 116 52234	100k 5% 0.5W
3404	4822 116 52233	10k 5% 0.5W
3405	4822 116 5[illegible]24	470Ω 5% 0.5W
3406	4822 116 52256	2k2 5% 0.5W
3407	4822 050 11002	1k 1% 0.4W
3416	4822 116 52233	10k 5% 0.5W
3417	4822 116 52233	10k 5% 0.5W
3418	4822 116 52233	10k 5% 0.5W
3419	4822 116 52233	10k 5% 0.5W
3421	4822 116 52283	4k7 5% 0.5W
3422	4822 116 52283	4k7 5% 0.5W
3423	4822 116 52283	4k7 5% 0.5W
3424	4822 116 90836	Res Network 5 x 10k
3425	4822 116 52283	4k7 5% 0.5W
3426	4822 116 52233	10k 5% 0.5W
3427	4822 116 52233	10k 5% 0.5W
3428	4822 116 52233	10k 5% 0.5W
3429	4822 116 52233	10k 5% 0.5W
3430	4822 116 52233	10k 5% 0.5W
3431	4822 116 52233	10k 5% 0.5W
3432	4822 050 11002	1k 1% 0.4W
3433	4822 116 52233	10k 5% 0.5W
3434	4822 116 52233	10k 5% 0.5W
3435	4822 116 52233	10k 5% 0.5W
3436	4822 116 52233	10k 5% 0.5W
3437	4822 116 52233	10k 5% 0.5W
3438	4822 116 52233	10k 5% 0.5W
3439	4822 116 52233	10k 5% 0.5W
3440	4822 050 11002	1k 1% 0.4W
3441	4822 050 11002	1k 1% 0.4W
3442	4822 050 11002	1k 1% 0.4W
3443	4822 050 11002	1k 1% 0.4W
3444	4822 050 11002	1k 1% 0.4W
3445	4822 050 11002	1k 1% 0.4W
3446	4822 050 11002	1k 1% 0.4W
3447	4822 050 11002	1k 1% 0.4W
3449	4822 116 90836	Res Network 5 x 10k
3450	4822 116 52233	10k 5% 0.5W
3451	4822 116 52233	10k 5% 0.5W
3452	4822 116 52233	10k 5% 0.5W
3453	4822 050 11002	1k 1% 0.4W
3454	4822 116 52263	2k7 5% 0.5W
3456	4822 050 11002	1k 1% 0.4W
3460	4822 116 52233	10k 5% 0.5W
3461	4822 116 52219	330Ω 5% 0.5W
3470	4822 116 52257	22k 5% 0.5W
3471	4822 116 52233	10k 5% 0.5W
3472	4822 116 52257	22k 5% 0.5W
3473	4822 116 52233	10k 5% 0.5W
3474	4822 116 52257	22k 5% 0.5W
3475	4822 116 52233	10k 5% 0.5W
3476	4822 116 52257	22k 5% 0.5W
3477	4822 116 52233	10k 5% 0.5W
3478	4822 116 52257	22k 5% 0.5W
3479	4822 116 52233	10k 5% 0.5W
3481	4822 116 52234	100k 5% 0.5W
3482	4822 116 52258	220k 5% 0.5W
3483	4822 116 52258	220k 5% 0.5W
3484	4822 116 52233	10k 5% 0.5W
3485	4822 116 52233	10k 5% 0.5W
3486	4822 116 52269	3k3 5% 0.5W
3487	4822 116 52233	10k 5% 0.5W
3490	4822 050 11002	1k 1% 0.4W
3491	4822 050 11002	1k 1% 0.4W
3492	4822 050 11002	1k 1% 0.4W
3493	4822 050 11002	1k 1% 0.4W
3494	4822 050 11002	1k 1% 0.4W
3495	4822 050 11002	1k 1% 0.4W
3498	4822 116 90836	Res Network 5 x 10k
3525	4822 116 52283	4k7 5% 0.5W

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5401	5322 242 73697	Cer Resonator 8MHz
5402	4822 242 70938	X'tal 32.768kHz
5403	4822 156 21721	Coil 2.2µH 10%
5404	4822 156 21125	Coil 3.9µH 10%
5409	4822 157 62552	Coil 2.2µH 20%
5412	4822 156 21721	Coil 2.2µH 10%
5413	4822 156 21721	Coil 2.2µH 10%
5415	4822 156 21721	Coil 2.2µH 10%

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6401	4822 130 30621	1N4148
6402	4822 130 30621	1N4148
6406	4822 214 52009	GP1U58XP
6410	4822 130 30621	1N4148
6411	4822 130 30621	1N4148
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6415	4822 130 30621	1N4148
6416	4822 130 30621	1N4148
6417	4822 130 30621	1N4148

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7401	4822 209 33236	TMP87CM20F
7402	4822 209 31508	ST24C01
7403	5322 209 10421	HEF4094BP
7410	4822 130 44196	BC548C
7420	5322 209 10421	HEF4094BP
7450	4822 209 10262	HEF4051BP
7451	4822 209 31515	BA3830S
7452	4822 209 80797	LM393N
7460	4822 130 44196	BC548C

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - COMBI BOARD

MISCELLANEOUS

1304	4822 267 31176	Loudspeaker Socket
1450	4822 276 13114	Tact Switch
1451	4822 276 13114	Tact Switch
1452	4822 276 13114	Tact Switch
1454	4822 276 13114	Tact Switch
1455	4822 276 13114	Tact Switch
1456	4822 276 13114	Tact Switch
1457	4822 276 13114	Tact Switch
1458	4822 276 13114	Tact Switch
1459	4822 276 13114	Tact Switch
1460	4822 276 13114	Tact Switch
1461	4822 276 13114	Tact Switch
1466	4822 276 13114	Tact Switch
1467	4822 276 13114	Tact Switch
1468	4822 276 13114	Tact Switch
1469	4822 276 13114	Tact Switch
1470	4822 276 13114	Tact Switch
1471	4822 276 13114	Tact Switch
1472	4822 276 13114	Tact Switch
1473	4822 276 13114	Tact Switch
1474	4822 276 13114	Tact Switch
1475	4822 276 13114	Tact Switch
1476	4822 276 13114	Tact Switch
1477	4822 276 13114	Tact Switch for Dolby version
1478	4822 276 13114	Tact Switch
1479	4822 276 13114	Tact Switch
1480	4822 276 13114	Tact Switch
1481	4822 276 13114	Tact Switch
1497	4822 134 41171	Lamp Assy Blue
1498	4822 134 41171	Lamp Assy Blue
1499	4822 134 41171	Lamp Assy Blue
1550	4822 267 40898	Headphone Socket
1551 @	4822 267 40898	Mic Socket
1552	4822 267 30631	AUX/TV Socket
1553 @	4822 276 12571	Vocal Fade Switch
1562 @	4822 267 40898	Mic Socket

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2252	5322 121 42386	100nF 5% 63V
2253	5322 121 42386	100nF 5% 63V
2254	4822 124 41397	47µF 20% 25V
2255	4822 126 10781	470pF 50V
2256	4822 126 11585	22nF +80-20% 25V
2258	5322 121 42386	100nF 5% 63V
2259	5322 121 42386	100nF 5% 63V
2260	4822 124 80148	2200µF 20% 16V
2261	4822 124 40201	1000µF 20% 16V
2262	4822 124 40849	330µF 20% 16V
2263	4822 124 40244	2.2µF 20% 63V
2264	5322 121 42386	100nF 5% 63V
2265	4822 124 41643	100µF 20% 16V
2266	4822 124 40248	10µF 20% 63V
2267	4822 124 41397	47µF 20% 25V
2268	4822 124 41993	2200µF 20% 35V
2271	4822 124 42367	3300µF 20% 35V
2272	4822 124 42367	3300µF 20% 35V
2274	5322 121 42386	100nF 5% 63V
2275	5322 121 42386	100nF 5% 63V

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ELECTRICAL PARTS - COMBI BOARD

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2277	4822 121 42007	100nF 10% 100V
2364	4822 124 40804	22µF 20% 63V
2365	4822 126 12785	47nF 50V
2366	4822 124 80196	47µF 20% 50V
2367	4822 126 12785	47nF 50V
2368	4822 124 40804	22µF 20% 63V
2369	4822 124 40239	0.47µF 20% 63V
2370	4822 124 40239	0.47µF 20% 63V
2371	4822 124 40244	2.2µF 20% 63V
2372	4822 124 40244	2.2µF 20% 63V
2373	4822 122 33519	470pF 10% 50V
2374	4822 122 33519	470pF 10% 50V
2375	4822 124 41397	47µF 20% 25V
2376	4822 124 41397	47µF 20% 25V
2377	4822 122 10459	560pF 10% 50V
2378	4822 122 10459	560pF 10% 50V
2379	4822 122 33197	1nF 10% 50V
2380	4822 122 33197	1nF 10% 50V
2385	4822 126 12145	47nF 10% 25V
2386	4822 126 12145	47nF 10% 25V
2387	4822 124 80196	47µF 20% 50V
2388	4822 124 80196	47µF 20% 50V
2389	4822 121 41854	150nF 5% 63V
2390	4822 121 41854	150nF 5% 63V
2391	4822 124 40239	0.47µF 20% 63V
2392	4822 124 40239	0.47µF 20% 63V
2450	4822 121 51387	10nF 20% 16V
2451	4822 122 33197	1nF 10% 50V
2501	4822 122 33195	100pF 10% 50V
2502	4822 122 33195	100pF 10% 50V
2505	4822 126 12339	2.2nF 10%
2506	4822 126 12339	2.2nF 10%
2507	4822 122 33519	470pF 10% 50V
2508	4822 122 33519	470pF 10% 50V
2509	4822 124 41398	1µF 20% 63V
2510	4822 124 41398	1µF 20% 63V
2511	4822 124 41398	1µF 20% 63V
2512	4822 124 41398	1µF 20% 63V
2513	4822 122 33197	1nF 10% 50V
2514	4822 122 33197	1nF 10% 50V
2515	4822 124 41398	1µF 20% 63V
2516	4822 124 41398	1µF 20% 63V
2517	4822 122 33195	100pF 10% 50V
2518	4822 122 33195	100pF 10% 50V
2519	4822 124 41398	1µF 20% 63V
2520	4822 124 41398	1µF 20% 63V
2521	4822 126 12145	47nF 10% 25V
2522	4822 126 12145	47nF 10% 25V
2552	4822 124 41643	100µF 20% 16V
2571	4822 122 10462	15pF 5% 50V
2572	4822 124 40196	220µF 20% 16V
2575	4822 124 41398	1µF 20% 63V
2576	4822 124 41398	1µF 20% 63V

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2577	4822 124 41398	1µF 20% 63V
2578	4822 124 41398	1µF 20% 63V
2579	4822 124 41398	1µF 20% 63V
2580	4822 124 41398	1µF 20% 63V
2581	4822 124 41398	1µF 20% 63V
2582	4822 124 41398	1µF 20% 63V
2583	4822 126 12333	100nF 20% 25V
2584	4822 126 12333	100nF 20% 25V
2585	4822 121 51252	470nF 5% 63V
2586	4822 121 51252	470nF 5% 63V
2587	4822 126 12145	47nF 10% 25V
2588	4822 126 12145	47nF 10% 25V
2591	4822 122 10577	3.3nF 10% 16V
2592	4822 122 10577	3.3nF 10% 16V
2593	5322 121 42662	68nF 5% 250V
2594	5322 121 42662	68nF 5% 250V
2595	4822 126 12145	47nF 10% 25V
2596	4822 126 12145	47nF 10% 25V
2597	4822 126 12333	100nF 20% 25V
2600	4822 124 40196	220µF 20% 16V
2601	5322 121 42386	100nF 5% 63V
2602	5322 121 42386	100nF 5% 63V
2603	4822 124 40248	10µF 20% 63V
2605	4822 124 41643	100µF 20% 16V
2607	4822 122 33195	100pF 10% 50V
2608	4822 122 33195	100pF 10% 50V
2609	4822 126 10778	220pF 50V
2613	4822 122 33195	100pF 10% 50V
2614	4822 122 33195	100pF 10% 50V
2615	4822 122 31072	47pF 2% 100V
2616	4822 126 12148	2.7nF 10%
2629	4822 124 41643	100µF 20% 16V
2630 @	5322 121 42661	330nF 5% 63V
2631 @	5322 121 42661	330nF 5% 63V
2632 @	4822 124 40244	2.2µF 20% 63V
2633 @	4822 124 40244	2.2µF 20% 63V
2634 @	5322 121 42662	68nF 5% 250V
2635 @	5322 121 42662	68nF 5% 250V
2636 @	4822 124 40244	2.2µF 20% 63V
2637 @	4822 124 40244	2.2µF 20% 63V
2638	4822 124 41398	1µF 20% 63V
2640 @	4822 124 41643	100µF 20% 16V
2641 @	4822 124 40849	330µF 20% 16V
2642 @	4822 124 41643	100µF 20% 16V
2643 @	4822 124 40246	4.7µF 20% 63V
2644 @	4822 122 33069	33pF 5% 50V
2645 @	4822 124 40246	4.7µF 20% 63V
2646 @	4822 122 33069	33pF 5% 50V
2647 @	4822 124 40244	2.2µF 20% 63V
2648 @	4822 124 40246	4.7µF 20% 63V
2649 @	4822 126 11585	22nF +80-20% 25V
2650 @	4822 126 11585	22nF +80-20% 25V
2651 @	4822 126 11585	22nF +80-20% 25V

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2652 @	4822 126 12787	330pF 10% 50V
2653 @	4822 126 12787	330pF 10% 50V
2654 @	4822 122 33195	100pF 10% 50V
2655 @	4822 122 33195	100pF 10% 50V
2656 @	4822 122 33197	1nF 10% 50V
2657	4822 124 41398	1µF 20% 63V
2658 @	4822 122 33197	1nF 10% 50V
2659 @	4822 122 33848	47pF 5% 50V

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3251	4822 116 52233	10k 5% 0.5W
3252	4822 116 52233	10k 5% 0.5W
3254	4822 116 52283	4k7 5% 0.5W
3255	4822 050 11002	1k 1% 0.4W
3256	4822 050 11002	1k 1% 0.4W
3257	4822 116 52233	10k 5% 0.5W
3258	4822 116 52283	4k7 5% 0.5W
3259	4822 116 52277	39k 5% 0.5W
3260	4822 116 52256	2k2 5% 0.5W
3261	4822 116 52284	47k 5% 0.5W
3262	4822 050 11002	1k 1% 0.4W
3263	4822 116 52283	4k7 5% 0.5W
3264	4822 116 52234	100k 5% 0.5W
3265	4822 116 52233	10k 5% 0.5W
3266	4822 050 11002	1k 1% 0.4W
3267	4822 116 52175	100Ω 5% 0.5W
3268	4822 116 52233	10k 5% 0.5W
3269	4822 116 52233	10k 5% 0.5W
3270	4822 116 52233	10k 5% 0.5W
3271	4822 050 11002	1k 1% 0.4W
3301	4822 116 52256	2k2 5% 0.5W
3303	4822 116 52234	100k 5% 0.5W
3304	4822 116 52263	2k7 5% 0.5W
3305	4822 050 21008	1Ω 1% 0.6W
3306	4822 050 21008	1Ω 1% 0.6W
3307	4822 050 21008	1Ω 1% 0.6W
3308	4822 050 21008	1Ω 1% 0.6W
3309	4822 050 21008	1Ω 1% 0.6W
3310	4822 050 21008	1Ω 1% 0.6W
3311	4822 050 21008	1Ω 1% 0.6W
3312	4822 050 21008	1Ω 1% 0.6W
3313	4822 050 21008	1Ω 1% 0.6W
3314	4822 050 21008	1Ω 1% 0.6W
3315	4822 116 52264	27k 5% 0.5W
3316	4822 116 52264	27k 5% 0.5W
3351	4822 053 10221	220Ω 5% 1W
3360	4822 052 10101 △	100Ω 5% 0.33W
3361	4822 050 11002	1k 1% 0.4W
3362	4822 050 11002	1k 1% 0.4W
3363	4822 116 52263	2k7 5% 0.5W
3368	4822 113 80525 △	OΩ15 10% 3W
3371	4822 116 52233	10k 5% 0.5W

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3372	4822 116 52233	10k 5% 0.5W
3373	4822 116 52291	56k 5% 0.5W
3374	4822 116 52291	56k 5% 0.5W
3375	4822 116 52224	470Ω 5% 0.5W
3376	4822 116 52224	470Ω 5% 0.5W
3377	4822 052 10478 △	4Ω7 5% 0.33W
3378	4822 052 10478 △	4Ω7 5% 0.33W
3379	4822 116 52256	2k2 5% 0.5W
3380	4822 116 52256	2k2 5% 0.5W
3381	4822 116 52256	2k2 5% 0.5W
3382	4822 116 52256	2k2 5% 0.5W
3383	4822 052 10108 △	1Ω 5% 0.33W
3384	4822 052 10108 △	1Ω 5% 0.33W
3385	4822 116 52291	56k 5% 0.5W
3386	4822 116 52291	56k 5% 0.5W
3387	4822 116 52213	180Ω 5% 0.5W
3388	4822 116 52213	180Ω 5% 0.5W
3389	4822 116 52217	270Ω 5% 0.5W
3390	4822 116 52217	270Ω 5% 0.5W
3397	4822 116 52291	56k 5% 0.5W
3398	4822 116 52291	56k 5% 0.5W
3399	4822 116 52244	15k 5% 0.5W
3400	4822 116 52244	15k 5% 0.5W
3501	4822 116 52238	12k 5% 0.5W
3502	4822 116 52238	12k 5% 0.5W
3503	4822 116 52303	8k2 5% 0.5W
3504	4822 116 52303	8k2 5% 0.5W
3505	4822 116 52233	10k 5% 0.5W
3506	4822 116 52233	10k 5% 0.5W
3507	4822 116 52243	1k5 5% 0.5W
3508	4822 116 52243	1k5 5% 0.5W
3509	4822 116 52296	6k8 5% 0.5W
3510	4822 116 52296	6k8 5% 0.5W
3511	4822 116 52249	1k8 5% 0.5W
3512	4822 116 52249	1k8 5% 0.5W
3513	4822 116 52235	1M 5% 0.5W
3514	4822 116 52235	1M 5% 0.5W
3515	4822 116 52235	1M 5% 0.5W
3516	4822 116 52235	1M 5% 0.5W
3517	4822 116 52269	3k3 5% 0.5W
3518	4822 116 52269	3k3 5% 0.5W
3519	4822 116 52238	12k 5% 0.5W
3520	4822 116 52238	12k 5% 0.5W
3521	4822 116 52276	3k9 5% 0.5W
3522	4822 116 52276	3k9 5% 0.5W
3523	4822 116 52175	100Ω 5% 0.5W
3524	4822 116 52175	100Ω 5% 0.5W
3527	4822 116 52235	1M 5% 0.5W
3528	4822 116 52235	1M 5% [illegible] W
3529	4822 116 52269	3k3 5% 0.5W
3530	4822 116 52269	3k3 5% 0.5W
3531	4822 050 11002	1k 1% 0.4W

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ELECTRICAL PARTS - COMBI BOARD

3532	4822 050 11002		1k 1% 0.4W
3535	4822 116 52224		470Ω 5% 0.5W
3536	4822 116 52224		470Ω 5% 0.5W
3537	4822 116 52224		470Ω 5% 0.5W
3538	4822 050 11002		1k 1% 0.4W
3539	4822 050 11002		1k 1% 0.4W
3541	4822 116 52235		1M 5% 0.5W
3542	4822 116 52235		1M 5% 0.5W
3543	4822 052 10339	⚠	33Ω 5% 0.33W
3545	4822 116 52265		270k 5% 0.5W
3546	4822 116 52265		270k 5% 0.5W
3547	4822 116 52269		3k3 5% 0.5W
3548	4822 116 52269		3k3 5% 0.5W
3549	4822 052 10339	⚠	33Ω 5% 0.33W
3554	4822 050 11002		1k 1% 0.4W
3555	4822 116 52234		100k 5% 0.5W
3556	4822 050 11002		1k 1% 0.4W
3557	4822 116 52233		10k 5% 0.5W
3565	4822 116 52263		2k7 5% 0.5W
3566	48[illegible] 116 52263		2k7 5% 0.5W
3567	4822 116 52222		390Ω 5% 0.5W
3568	4822 116 52222		390Ω 5% 0.5W
3569	4822 116 52235		1M 5% 0.5W
3570	4822 116 52235		1M 5% 0.5W
3571	4822 116 52271		33k 5% 0.5W
3572	4822 052 10339	⚠	33Ω 5% 0.33W
3573	4822 116 52256		2k2 5% 0.5W
3574	4822 116 52256		2k2 5% 0.5W
3575	4822 116 52243		1k5 5% 0.5W
3576	4822 116 52243		1k5 5% 0.5W
3577	4822 116 52292		560k 5% 0.5W
3578	4822 116 52292		560k 5% 0.5W
3579	4822 116 52271		33k 5% 0.5W
3580	4822 116 52271		33k 5% 0.5W
3581	4822 116 52271		33k 5% 0.5W
3582	4822 116 52271		33k 5% 0.5W
3583	4822 116 52271		33k 5% 0.5W
3584	4822 116 52271		33k 5% 0.5W
3585	4822 116 52233		10k 5% 0.5W
3587	4822 116 52285		470k 5% 0.5W
3588	4822 116 52285		470k 5% 0.5W
3589	4822 116 52285		470k 5% 0.5W
3590	4822 116 52285		470k 5% 0.5W
3591	4822 116 52285		470k 5% 0.5W
3592	4822 116 52285		470k 5% 0.5W
3593	4822 116 52285		470k 5% 0.5W
3594	4822 116 52285		470k 5% 0.5W
3595	4822 116 52292		560k 5% 0.5W
3596	4822 116 52292		560k 5% 0.5W
3597	4822 116 52222		390Ω 5% 0.5W
3598	4822 116 52222		390Ω 5% 0.5W
3599	4822 116 52243		1k5 5% 0.5W

3600	4822 116 52243		1k5 5% 0.5W
3601	4822 116 52257		22k 5% 0.5W
3602	4822 116 52257		22k 5% 0.5W
3607	4822 116 52285		470k 5% 0.5W
3608	4822 116 52285		470k 5% 0.5W
3609	4822 116 52285		470k 5% 0.5W
3610	4822 116 52285		470k 5% 0.5W
3611	4822 116 52235		1M 5% 0.5W
3612	4822 116 52235		1M 5% 0.5W
3613	4822 050 11002		1k 1% 0.4W
3614	4822 050 11002		1k 1% 0.4W
3615	4822 116 52215		220Ω 5% 0.5W
3616	4822 116 52215		220Ω 5% 0.5W
3617	4822 116 52215		220Ω 5% 0.5W
3618	4822 116 52215		220Ω 5% 0.5W
3619	4822 050 11002		1k 1% 0.4W
3620	4822 050 11002		1k 1% 0.4W
3621	4822 050 11002		1k 1% 0.4W
3622	4822 050 11002		1k 1% 0.4W
3623	4822 116 52257		22k 5% 0.5W
3624	4822 116 52257		22k 5% 0.5W
3625	4822 116 52263		2k7 5% 0.5W
3626	4822 116 52263		2k7 5% 0.5W
3627	4822 116 52222		390Ω 5% 0.5W
3628	4822 116 52222		390Ω 5% 0.5W
3629	4822 102 10414		Potm 20k x 2 w/motor
3630 @	4822 116 52251		18k 5% 0.5W
3631 @	4822 116 52251		18k 5% 0.5W
3632 @	4822 116 52234		100k 5% 0.5W
3633 @	4822 116 52234		100k 5% 0.5W
3634 @	4822 116 52265		270k 5% 0.5W
3635 @	4822 116 52265		270k 5% 0.5W
3636 @	4822 116 52289		5k6 5% 0.5W
3637 @	4822 116 52289		5k6 5% 0.5W
3638 @	4822 116 52263		2k7 5% 0.5W
3639 @	4822 116 52263		2k7 5% 0.5W
3640 @	4822 116 52303		8k2 5% 0.5W
3641 @	4822 116 52303		8k2 5% 0.5W
3642 @	4822 116 52244		15k 5% 0.5W
3643 @	4822 116 52244		15k 5% 0.5W
3644 @	4822 116 52234		100k 5% 0.5W
3645 @	4822 116 52234		100k 5% 0.5W
3646 @	4822 116 52234		100k 5% 0.5W
3647 @	4822 116 52234		100k 5% 0.5W
3648	4822 116 52235		1M 5% 0.5W
3649	4822 116 52249		1k8 5% 0.5W
3652 @	4822 116 81682		2M2 5% 0.5W
3653 @	4822 116 81682		2M2 5% 0.5W
3654 @	4822 116 52243		1k5 5% 0.5W
3655 @	4822 116 52243		1k5 5% 0.5W
3656 @	4822 116 52219		330Ω 5% 0.5W
3657 @	4822 116 52219		330Ω 5% 0.5W

3658 @	4822 116 52175		100Ω 5% 0.5W
3659 @	4822 116 52175		100Ω 5% 0.5W
3661 @	4822 116 52207		1k2 5% 0.5W
3662 @	4822 116 52233		10k 5% 0.5W
3663 @	4822 116 52228		680Ω 5% 0.5W
3664 @	4822 116 52249		1k8 5% 0.5W
3665 @	4822 116 52283		4k7 5% 0.5W
3666 @	4822 116 52224		470Ω 5% 0.5W
3667 @	4822 116 52269		3k3 5% 0.5W
3668 @	4822 116 52245		150k 5% 0.5W
3669 @	4822 116 52258		220k 5% 0.5W
3671 @	4822 116 52234		100k 5% 0.5W
3672 @	4822 116 52234		100k 5% 0.5W
3673 @	4822 101 21204		Potm Rotary 20KA
3674 @	4822 116 52207		1k2 5% 0.5W
3675 @	4822 052 10479	⚠	47Ω 5% 0.33W
3676 @	4822 116 52207		1k2 5% 0.5W
3677 @	4822 116 52233		10k 5% 0.5W
3678 @	4822 116 52233		10k 5% 0.5W
3679	4822 116 52233		10k 5% 0.5W
3680	4822 116 52284		47k 5% 0.5W
3681	4822 050 11002		1k 1% 0.4W
3682	4822 050 11002		1k 1% 0.4W
3683	4822 050 11002		1k 1% 0.4W
3684	4822 050 11002		1k 1% 0.4W
3685	4822 050 11002		1k 1% 0.4W
3686	4822 050 11002		1k 1% 0.4W

5313	4822 280 80777	Relay 2P 12V 7A
5373	4822 157 62552	Coil 2.2μH 20%
5374	4822 157 62552	Coil 2.2μH 20%
5630 @	4822 157 52286	Coil 22μH 10%
5631 @	4822 157 52286	Coil 22μH 10%
5632	4822 156 21125	Coil 3.9μH 10%

6250	4822 130 82078	⚠	D5SBA20
6251	4822 130 30621		1N4148
6252	4822 130 30621		1N4148
6253	4822 130 34173		BZX79-C5V6
6254	4822 130 30621		1N4148
6255	5322 130 30684	⚠	1N4002
6256	5322 130 30684	⚠	1N4002
6257	5322 130 30684	⚠	1N4002
6258	5322 130 30684	⚠	1N4002
6259	4822 130 30621		1N4148
6260	5322 130 30684	⚠	1N4002
6261	4822 130 34233		BZX79-C5V1

6262	4822 130 31631	⚠	BYV10-20
6263	4822 130 31631	⚠	BYV10-20
6264	5322 130 30684	⚠	1N4002
6265	4822 130 31253		BZX79-C2V4
6266	4822 130 30621		1N4148
6352	4822 130 30621		1N4148
6450	4822 130 30621		1N4148
6451	4822 130 30621		1N4148
6452	4822 130 30621		1N4148
6454	4822 130 30621		1N4148
6455	4822 130 30621		1N4148
6456	4822 130 30621		1N4148
6457	4822 130 30621		1N4148
6504	4822 130 30621		1N4148
6505	4822 130 30621		1N4148
6507	4822 130 30861		BZX79-C7V5
6508	4822 130 30861		BZX79-C7V5

7250	4822 130 40937		BC548B
7252	4822 130 61236	⚠	BD234
7253	4822 130 40937		BC548B
7254	4822 130 40937		BC548B
7255	4822 130 44197		BC558B
7256	4822 130 40937		BC548B
7257	4822 209 80891	⚠	MC7805CT
7318	4822 130 44197		BC558B
7319	4822 130 40937		BC548B
7320	4822 130 40937		BC548B
7350	4822 209 31514	⚠	STK4132II
7501	4822 209 10263		HEF4052B
7502	5322 209 10421		HEF4094BP
7503	4822 130 44246		BC549C
7504	4822 130 44246		BC549C
7505	4822 130 44246		BC549C
7506	4822 130 44246		BC549C
7513	5322 130 44779		BC338-40
7514	5322 130 44779		BC338-40
7521	5322 130 44779		BC338-40
7522	5322 130 44779		BC338-40
7523	4822 130 41715		BC328-40
7524	4822 130 41715		BC328-40
7525	4822 130 40937		BC548B
7526	4822 130 40937		BC548B
7529	4822 130 40937		BC548B
7530	4822 130 40937		BC548B
7571	4822 130 44197		BC558B
7572	4822 130 44197		BC558B
7575	4822 130 44246		BC549C

@ For Karaoke version only

ELECTRICAL PARTS - COMBI BOARD

7576	4822 130 44246	BC549C
7577	4822 130 44246	BC549C
7578	4822 130 44246	BC549C
7581	5322 209 14865	MC14066BCP
7582	5322 209 14865	MC14066BCP
7583	4822 130 41327	BC327-40
7630 @	4822 130 44246	BC549C
7631 @	4822 130 44246	BC549C
7632 @	4822 130 44246	BC549C
7633 @	4822 130 44246	BC549C
7634 @	4822 130 44246	BC549C
7635 @	4822 130 44246	BC549C
7636	5322 209 10421	HEF4094BD
7637	4822 130 44246	BC549C

@ For Karaoke version only

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - ETF3 BOARD

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2650 *	4822 124 40248	10μF 20% 63V
2651 *	4822 124 40248	10μF 20% 63V
2652 *	4822 124 40242	1μF 20% 63V
2653 *	4822 124 40242	1μF 20% 63V
2654 *	4822 122 33891	3.3nF 10% 63V
2655 *	4822 122 33891	3.3nF 10% 63V
2656 *	5322 122 32452	47pF 5% 63V
2657 *	5322 122 32452	47pF 5% 63V
2658 *	5322 122 32452	47pF 5% 63V
2659 *	5322 122 32452	47pF 5% 63V
2660 *	4822 124 40244	2.2μF 20% 63V
2661 *	4822 124 40244	2.2μF 20% 63V
2668 *	5322 121 42498	680nF 5% 63V
2669 *	5322 121 42498	680nF 5% 63V
2672 *	4822 124 41525	100μF 20% 25V
2673 *	4822 124 41525	100μF 20% 25V
2674	4822 122 33496	100nF 10% 63V
2675	4822 122 33496	100nF 10% 63V
2676	5322 122 32531	100pF 5% 50V
2677	5322 122 32531	100pF 5% 50V
2678	4822 122 33515	82pF 5% 63V
2679	4822 122 33515	82pF 5% 63V
2680	4822 122 33575	220pF 5% 50V
2681	4822 122 33575	220pF 5% 50V
2682	4822 124 40242	1μF 20% 63V
2683	4822 124 40242	1μF 20% 63V
2684	5322 122 32452	47pF 5% 63V
2685	5322 122 32452	47pF 5% 63V
2686	5322 122 32659	33pF 5% 50V
2687	5322 122 32659	33pF 5% 50V
2688	4822 124 41525	100μF 20% 25V
2690 *	4822 124 40248	10μF 20% 63V
2692	4822 124 40242	1μF 20% 63V
2693	4822 124 40242	1μF 20% 63V
2700	5322 122 34099	470pF 10% 63V
2701	5322 122 34099	470pF 10% 63V
2702	4822 122 32535	680pF 10% 63V
2703	4822 122 32535	680pF 10% 63V
2704	5322 122 31863	330pF 5% 50V
2705	5322 122 31863	330pF 5% 50V
2706	5322 122 34099	470pF 10% 63V
2707	5322 122 34099	470pF 10% 63V
2708 *	4822 124 41525	100μF 20% 25V
2708 #	4822 124 41997	470μF 20% 10V
2709 *	4822 124 41525	100μF 20% 25V
2709 #	4822 124 41997	470μF 20% 10V
2710	4822 122 33128	15nF 10% 63V
2711	4822 122 33128	15nF 10% 63V
2712	5322 122 34123	1nF 10% 50V
2713	5322 122 34123	1nF 10% 50V
2714	4822 124 40248	10μF 20% 63V
2715	4822 124 40248	10μF 20% 63V

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2716	4822 124 41525	100μF 20% 25V
2717	4822 124 22263	220μF 20% 25V
2718	4822 124 40248	10μF 20% 63V
2730	4822 122 33515	82pF 5% 63V
2731	4822 122 33515	82pF 5% 63V
2732	4822 122 33806	820pF 10% 63V
2733	4822 122 33806	820pF 10% 63V
2734	5322 122 32654	22nF 10% 63V
2735	5322 122 32654	22nF 10% 63V
2736	4822 122 33177	10nF 20% 50V
2737	4822 122 33177	10nF 20% 50V
2738	4822 124 40242	1μF 20% 63V
2739	4822 124 40242	1μF 20% 63V
2740	4822 124 40246	4.7μF 20% 63V
2741	4822 124 40246	4.7μF 20% 63V
2742	4822 124 40242	1μF 20% 63V
2743	4822 124 40242	1μF 20% 63V
2744	5322 122 34123	1nF 10% 50V
2745	5322 122 34123	1nF 10% 50V
2746	4822 121 51252	470nF 5% 63V
2747	4822 121 51252	470nF 5% 63V
2748	4822 124 40248	10μF 20% 63V
2749	4822 124 40248	10μF 20% 63V
2750	4822 124 40433	47μF 20% 25V
2751	4822 124 40242	1μF 20% 63V
2752	5322 126 10223	4.7nF 10% 63V
2753	5322 126 10223	4.7nF 10% 63V
2754	5322 126 10223	4.7nF 10% 63V
2755	4822 124 41525	100μF 20% 25V
2756	4822 124 40246	4.7μF 20% 63V
2757	4822 124 22263	220μF 20% 25V
2760	5322 122 32659	33pF 5% 50V
2761	5322 122 32659	33pF 5% 50V
2762	5322 121 42975	15nF 5% 250V
2764	5322 126 10223	4.7nF 10% 63V
2765	4822 122 33177	10nF 20% 50V
2766	4822 124 40246	4.7μF 20% 63V
2768	4822 124 41525	100μF 20% 25V
2791	5322 122 34123	1nF 10% 50V
2796	5322 122 32654	22nF 10% 63V
2797	4822 124 40242	1μF 20% 63V
2799	4822 124 41584	100μF 20% 10V
2782	4822 122 33342	33nF 10% 63V
2787	4822 122 33342	33nF 10% 63V
2800	4822 124 41525	100μF 20% 25V
2808	4822 124 40244	2.2μF 20% 63V
2810	5322 122 34123	1nF 10% 50V
2811	5322 122 34123	1nF 10% 50V

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3501 *	4822 051 10008	0Ω Jumper (1206)
3650 *	4822 051 20104	100k 5% 0.1W
3651 *	4822 051 20104	100k 5% 0.1W
3652 *	4822 100 11771	Trimmer 20k 30% 0.1W
3653 *	4822 100 11771	Trimmer 20k 30% 0.1W
3654 *	4822 100 11771	Trimmer 20k 30% 0.1W
3655 *	4822 100 11771	Trimmer 20k 30% 0.1W
3656	4822 051 10102	1k 2% 0.25W
3657	4822 051 10102	1k 2% 0.25W
3658 *	4822 050 11002	1k 1% 0.4W
3659 *	4822 050 11002	1k 1% 0.4W
3660 *	4822 050 11002	1k 1% 0.4W
3661 *	4822 050 11002	1k 1% 0.4W
3662 *	4822 051 20562	5k6 5% 0.1W
3663 *	4822 051 20562	5k6 5% 0.1W
3664	4822 051 20153	15k 5% 0.1W
3665	4822 051 20153	15k 5% 0.1W
3666	4822 116 52264	27k 5% 0.5W
3667	4822 116 52264	27k 5% 0.5W
3673 *	4822 051 20393	39k 5% 0.1W
3674 *	4822 052 10478 △	4Ω7 5% 0.33W
3675	4822 051 20152	1k5 5% 0.1W
3678	4822 051 20474	470k 5% 0.1W
3679	4822 051 20474	470k 5% 0.1W
3680	4822 051 20152	1k5 5% 0.1W
3681	4822 051 20152	1k5 5% 0.1W
3682	4822 051 20471	470Ω 5% 0.1W
3684 #	4822 117 10833	10k 5% 0.1W
3685 #	4822 117 10833	10k 5% 0.1W
3686 #	4822 051 20123	12k 5% 0.1W
3687 #	4822 051 20123	12k 5% 0.1W
3688 *	4822 051 20332	3k3 5% 0.1W
3689 *	4822 051 20332	3k3 5% 0.1W
3694	4822 051 20223	22k 5% 0.1W
3695	4822 051 20223	22k 5% 0.1W
3696	4822 051 20223	22k 5% 0.1W
3697	4822 051 20223	22k 5% 0.1W
3698	4822 051 20153	15k 5% 0.1W
3699 *	4822 051 20392	3k9 5% 0.1W
3700	4822 116 52224	470Ω 5% 0.5W
3701	4822 116 52224	470Ω 5% 0.5W
3702	4822 051 20471	470Ω 5% 0.1W
3703	4822 116 52224	470Ω 5% 0.5W
3704	4822 051 20154	150k 5% 0.1W
3705	4822 051 20154	150k 5% 0.1W
3706 *	4822 051 20479	47Ω 5% 0.1W
3706 #	4822 051 20129	12Ω 5% 0.1W
3707 *	4822 051 20479	47Ω 5% 0.1W
3707 #	4822 051 20129	12Ω 5% 0.1W
3708	4822 116 52303	8k2 5% 0.5W

* For Dolby B version only
# For Non-Dolby version only

ELECTRICAL PARTS - ETF3 BOARD

3709	4822 051 20822	8k2 5% 0.1W
3710	4822 116 52283	4k7 5% 0.5W
3711	4822 051 20472	4k7 5% 0.1W
3712	4822 116 52303	8k2 5% 0.5W
3713	4822 051 20822	8k2 5% 0.1W
3714	4822 116 52283	4k7 5% 0.5W
3715	4822 051 20472	4k7 5% 0.1W
3720	4822 051 20008	0Ω Jumper (0805)
3721	4822 051 20008	0Ω Jumper (0805)
3722	4822 116 52224	470Ω 5% 0.5W
3723	4822 116 52224	470Ω 5% 0.5W
3724	4822 116 52245	150k 5% 0.5W
3730	4822 116 52233	10k 5% 0.5W
3731	4822 116 52233	10k 5% 0.5W
3732	4822 116 52175	100Ω 5% 0.5W
3733	4822 116 52175	100Ω 5% 0.5W
3734	4822 116 52284	47k 5% 0.5W
3735	4822 116 52284	47k 5% 0.5W
3736	4822 116 52233	10k 5% 0.5W
3737	4822 116 52233	10k 5% 0.5W
3738	4822 100 11771	Trimmer 20k 30% 0.1W
3739	4822 100 11771	Trimmer 20k 30% 0.1W
3740	4822 051 20562	5k6 5% 0.1W
3741	4822 051 20562	5k6 5% 0.1W
3742	4822 051 20223	22k 5% 0.1W
3743	4822 051 20223	22k 5% 0.1W
3744	4822 051 20123	12k 5% 0.1W
3745	4822 051 10102	1k 2% 0.25W
3746	4822 051 10102	1k 2% 0.25W
3747	4822 051 10102	1k 2% 0.25W
3748	4822 116 52271	33k 5% 0.5W
3749	4822 116 52219	330Ω 5% 0.5W
3760	4822 051 20109	10Ω 5% 0.1W
3761	4822 051 20109	10Ω 5% 0.1W
3762	4822 100 11163	Trimmer 100k 30% 0.1W
3763	4822 100 11163	Trimmer 100k 30% 0.1W
3764	4822 051 20339	33Ω 5% 0.1W
3765	4822 051 20682	6k8 5% 0.1W
3766	4822 051 20159	15Ω 5% 0.1W
3767	4822 051 20223	22k 5% 0.1W
3768	4822 051 10102	1k 2% 0.25W
3769	4822 117 10833	10k 1% 0.1W
3770	4822 051 20392	3k9 5% 0.1W
3771	4822 051 20221	220Ω 5% 0.1W
3772	4822 117 10833	10k 1% 0.1W
3773	4822 052 10478 △	4Ω7 5% 0.33W
3774	4822 116 52257	22k 5% 0.5W
3780	4822 051 20822	8k2 5% 0.1W
3781	4822 116 52296	6k8 5% 0.5W
3782	4822 100 11319	Trimmer 4k7 30% 0.1W
3783	4822 100 11319	Trimmer 4k7 30% 0.1W
3784	4822 116 52283	4k7 5% 0.5W
3785	4822 051 10102	1k 2% 0.25W
3786	4822 051 10102	1k 2% 0.25W

3787	4822 051 10102	1k 2% 0.25W
3788	4822 051 20104	100k 5% 0.1W
3789	4822 051 20104	100k 5% 0.1W
3790	4822 051 20104	100k 5% 0.1W
3791	4822 116 52284	47k 5% 0.5W
3792	4822 116 52284	47k 5% 0.5W
3793	4822 116 52284	47k 5% 0.5W
3794	4822 051 20183	18k 5% 0.1W
3795	4822 051 20183	18k 5% 0.1W
3796	4822 050 11002	1k 1% 0.4W
3797	4822 050 11002	1k 1% 0.4W
3798	4822 116 52175	100Ω 5% 0.5W
3799	4822 050 11002	1k 1% 0.4W
3800	4822 050 11002	1k 1% 0.4W
3801	4822 050 11002	1k 1% 0.4W
3802	4822 050 11002	1k 1% 0.4W
3803	4822 116 52175	100Ω 5% 0.5W
3804	4822 116 52215	220Ω 5% 0.5W
3805	4822 051 10102	1k 2% 0.25W
3806	4822 117 10833	10k 1% 0.1W
3807	4822 051 20472	4k7 5% 0.1W
3808	4822 117 10833	10k 1% 0.1W
3809	4822 117 10833	10k 1% 0.1W
3810	4822 117 10833	10k 1% 0.1W
3811	4822 051 20472	4k7 5% 0.1W
3812	4822 051 20392	3k9 5% 0.1W
3813	4822 117 10833	10k 1% 0.1W
3814	4822 051 20105	1M 5% 0.1W
3822	4822 050 11002	1k 1% 0.4W
3823	4822 050 11002	1k 1% 0.4W
3824	4822 050 11002	1k 1% 0.4W
3825	4822 050 11002	1k 1% 0.4W
3826	4822 050 11002	1k 1% 0.4W
3827	4822 117 10834	47k 1% 0.1W
3828	4822 117 10833	10k 1% 0.1W
3829	4822 051 10102	1k 2% 0.25W
3830	4822 051 10102	1k 2% 0.25W
3831	4822 051 10102	1k 2% 0.25W
3833 *	4822 117 10833	10k 1% 0.1W
3836	4822 051 10102	1k 2% 0.25W
3837 *	4822 116 52233	10k 5% 0.5W
3839	4822 052 10159 △	15Ω 5% 0.33W
3840	4822 116 52233	10k 5% 0.5W
3841	4822 116 52283	4k7 5% 0.5W
3842	4822 051 20223	22k 5% 0.1W
3844	4822 051 20223	22k 5% 0.1W
3856	4822 116 52233	10k 5% 0.5W
3857	4822 117 10833	10k 1% 0.1W
3858	4822 051 20474	470k 5% 0.1W
3859	4822 117 10833	10k 1% 0.1W
3860	4822 051 20223	22k 5% 0.1W
3861	4822 051 20223	22k 5% 0.1W
3864 *	4822 051 20008	0Ω Jumper (0805)
3865	4822 051 20008	0Ω Jumper (0805)

5650 *	4822 156 21725	MPX Filter
5651 *	4822 156 21725	MPX Filter
5652	4822 156 20811	Coil 36mH 5%
5653	4822 156 20811	Coil 36mH 5%
5730	4822 156 20811	Coil 36mH 5%
5731	4822 156 20811	Coil 36mH 5%
5760	4822 156 20946	Osc coil 100kHz
5780	4822 242 72527	Cer Resonator 4MHz
5790	4822 157 53941	Coil 100μH 10%

6650	4822 130 34233	BZX79-C5V1
6760	4822 130 61219	BZX79-C10V
6780	5322 130 30684	1N4002
6781	5322 130 30684	1N4002
6782	4822 130 30621	1N4148
6783	4822 130 30621	1N4148
6784	4822 130 30621	1N4148
7650	4822 209 32919	HEF4952BT
7651 *	4822 209 72546	CXA1101P
7652	5322 130 42136	BC848C
7653	5322 130 42136	BC848C
7654	5322 130 42136	BC848C
7655	5322 130 42136	BC848C
7656	5322 130 42136	BC848C
7657	5322 130 42136	BC848C
7700	4822 209 32919	HEF4952BT
7701	4822 209 61667	UPC1330HA
7702	4822 209 32918	AN7318S
7703	5322 209 11102	HEF4052BT
7730	4822 209 31505	CXA1298AP
7760	5322 130 44779	BC338-40
7761	5322 130 44779	BC338-40
7762	4822 130 44196	BC548C
7763	4822 130 44196	BC548C
7764	4822 130 42682	DTA144ES
7765	4822 130 60588	DTC114ES
7780	4822 130 41715	BC328-40
7781	4822 130 41715	BC328-40
7782	4822 130 41715	BC328-40
7783	5322 130 42136	BC848C
7784	5322 130 42136	BC848C
7785	5322 130 42136	BC848C
7786	4822 130 42513	BC858C
7787	5322 130 42136	BC848C
7791	5322 130 42136	BC848C
7792	4822 209 72042	MC78L05ACP
7793	4822 209 12612	MC68HC05C4P

* For Dolby B version only
# For Non-Dolby version only

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - TRAFO BOARD

MISCELLANEOUS

1281	4822 272 10269 △	Voltage Selector for -/21 only
1284	4822 071 51002 △	Fuse T1A 250V
1285	4822 071 51002 △	Fuse T1A 250V
1286	4822 071 51002 △	Fuse T1A 250V
1287	4822 071 51002 △	Fuse T1A 250V
1288	4822 071 54002 △	Fuse T4A 250V
1289	4822 071 54002 △	Fuse T4A 250V

5280	4822 146 31335 △	Mains Transformer
5281	4822 157 70003 △	Mains Choke Coil

Note: Only the parts mentioned in this list are normal service spare parts.

Procedure to replace belts/mechanisms

1. Remove the damper gear assembly (pos 13 + 14) and gear lever (pos 9).

2. Remove 4 screws (pos 5) and Playback mechanism (pos A-1) and Rec/Pb mechanism pos (A-2) can now be separated.

Note: The assembly of main belt for the Rec/Pb mechanism must always be done before that of Playback mechanism.

3A. Record/Pb Mechanism A-2

i) Unscrew 4 screws (pos 85 + 86) and remove the cover bracket (pos 41).
ii) Route the belt as shown in figure 1 around the temporary pins (see arrow).
iii) Assemble the cover bracket (pos 41), care should be taken not to loosen the belt.
iv) Assemble the motor bracket assembly (pos 1 + 3) onto the Rec/Pb mechanism.
v) Use a wire with a hook end (see figure 3), transfer the belt from the temporary position onto the motor pulley (pos 1) as in figure 5 & 6.

2B. Playback Mechanism A-1

i) Place a piece of tape to hold the eject lever (pos 11) to bracket (pos 16) and remove the door catch (pos 12).
ii) Unscrew 4 screws (pos 85 + 86) and remove the cove bracket (pos 41).
iii) Route the belt as shown in figure 2 around the temporary pins (see arrow).
iv) Assemble the cover bracket (pos 41), care should be taken not to loosen the belt.
v) Assemble the Playback mechanism A-1 onto the rest of the tape mechanism.
vi) Use a wire with a hook end (see figure 3), transfer the belt from the temporary position onto the motor pulley (pos 1) and the small pulley (pos 42) on cover bracket as in figure 4 - 6.
vii) Remove the tape on the eject lever and assemble door catch (pos 12).

3. Assemble the damper gear assembly (pos 13 + 14) and gear lever (pos 9).

4. After completion, perform the tape adjustment to ensure no mis-alignment due to handling.

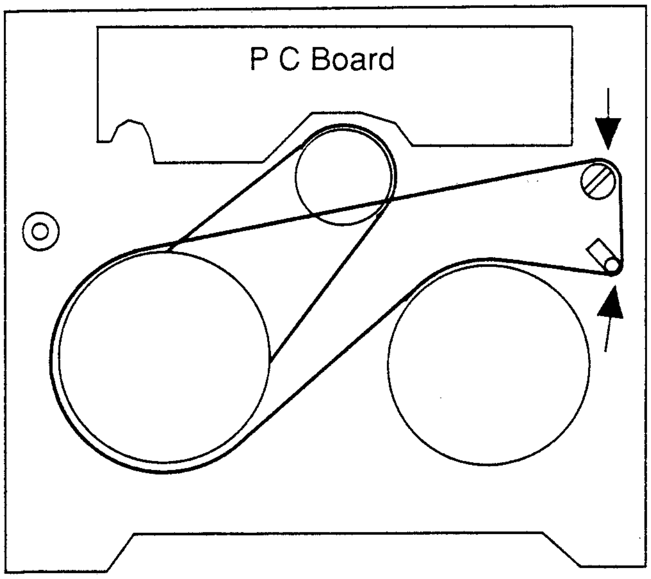


Figure 1. Rec/Pb mechanism A-2

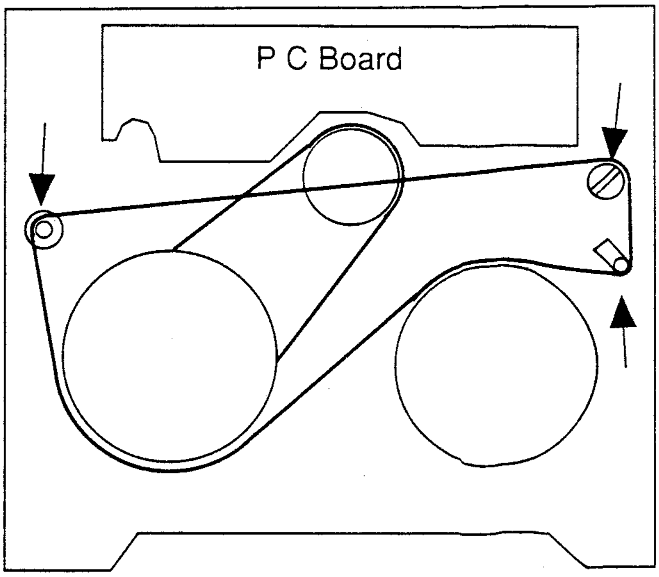


Figure 2. Play mechanism A-1

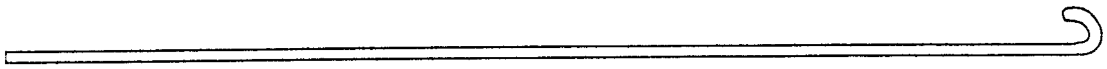


Figure 3. Wire with hook at the end

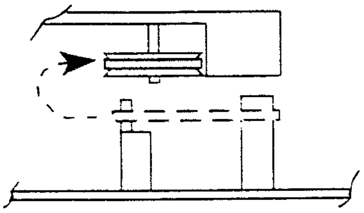


Figure 4. Hook belt onto pulley

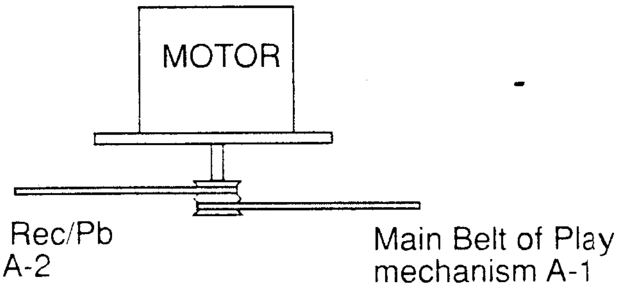

MOTOR
Main Belt of Rec/Pb mechanism A-2
Main Belt of Play mechanism A-1

Figure 5. Motor pulley Belt hooking

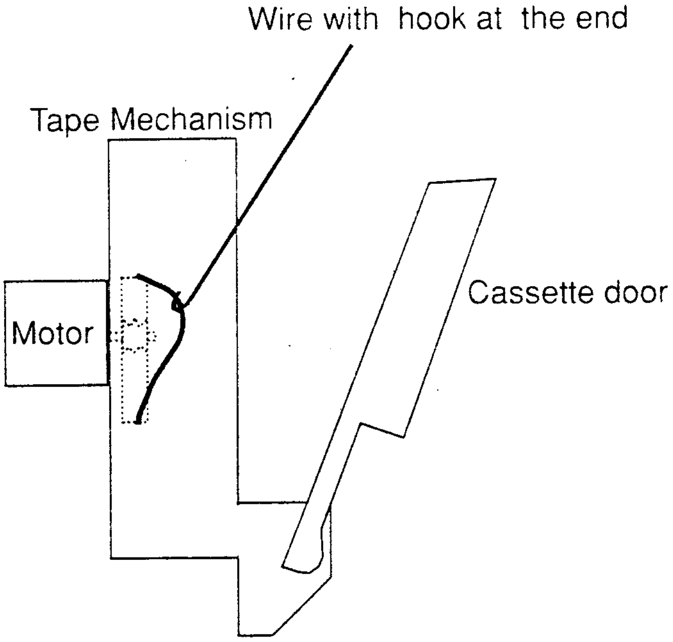

Wire with hook at the end
Tape Mechanism
Motor
Cassette door

Figure 6. Hooking of the belt onto the motor pulley

FW46/20/21/21M/22/25/34/41M

A95 - 150

Service
Service
Service

Product Service Group CE Audio

Service Information

Already published informations:

A94-153 (4822 725 25133)
A94-155 (4822 725 25138)
A94-158 (4822 725 25143)
A94-159 (4822 725 25147)

Quick reference:

RZ 02	Introduction of improved disc clamper
RZ 03	Introduction of new DAC IC TDA1549T
RZ 04	Introduction of new Tuner

From wk 9443 onwards an improved disc clamper was introduced to solve whistling sound or zooming sound (frequency of about 500Hz) that is audiable during Play. In worse case skip tracks happen and the audio output is interrupted. This phenomenon is especially true at low temperature and when playing thin disc. The set can be recognized by serial number RZ 02 ....

The serivce code for the improved disc is 4822 691 30358. Updated portion of CD mechanism and parts list is given in figure 1.

From wk 9448 onwards a new DAC IC (TDA1549T) was introduced. The new sets can be recognized by serial number RZ 03 .... With its introduction, the following changes are made:

Combi board

Change	3505 to	22k 5% 0.5W	4822 116 52257
	3506 to	22k 5% 0.5W	4822 116 52257
	3507 to	6k8 5% 0.5W	4822 116 52296
	3508 to	6k8 5% 0.5W	4822 116 52296

CD board

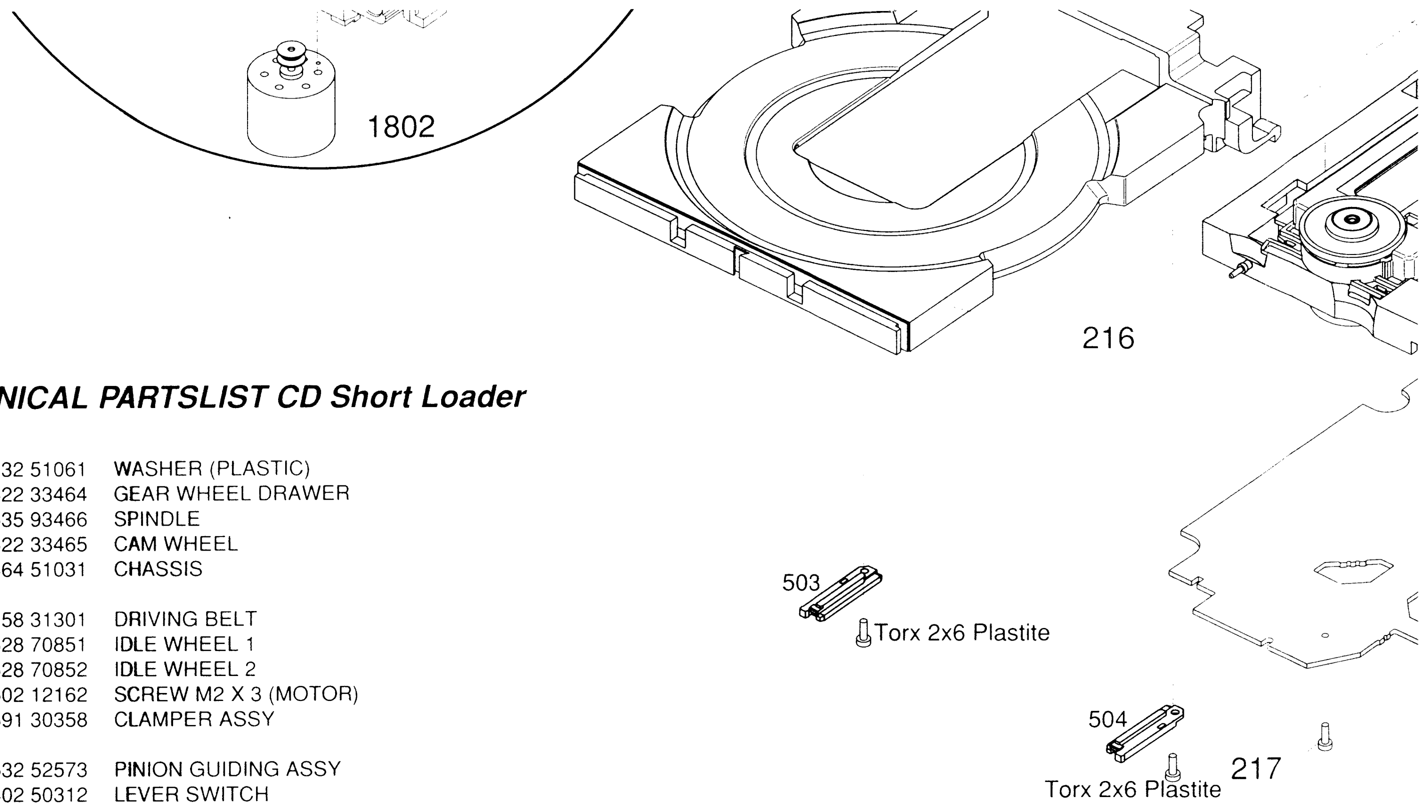
Change	2864 to	47µF 20% 6.3V	4822 124 80483
	2866 to	47µF 20% 6.3V	4822 124 80483
	3867 to	100Ω 5% 0.1W	4822 051 20101
Add	2863	33nF 10% 63V	4822 122 33342
	2865	47µF 20% 6.3V	4822 124 80483
	2868	1nF 10% 50V	5322 122 34123
	2869	1nF 10% 50V	5322 122 34123
	3767	1k 1% 0.4W	4822 050 11002
	3770	1k 1% 0.4W	4822 050 11002
	3868	100Ω 5% 0.1W	4822 051 20101
	7870	TDA1549T/N1	4822 209 33252
Delete	3795		
	7871		
	7872		

Updated portion of the CD schematics and layout drawings are given in figure 2 to 4.

From wk 9506 onwards a new tuner board was introduced. The new sets can be recognized by the serial number RZ 04 .... The new tuners are:

ECO4VA	for all versions except -/22
TUNER 92VA	for -/22 only

Enclosed are the new schematics, layout and parts list.


1802
216
503
Torx 2x6 Plastite
504
Torx 2x6 Plastite
217

MECHANICAL PARTSLIST CD Short Loader

201	4822 532 51061	WASHER (PLASTIC)
202	4822 522 33464	GEAR WHEEL DRAWER
203	4822 535 93466	SPINDLE
204	4822 522 33465	CAM WHEEL
206	4822 464 51031	CHASSIS
207	4822 358 31301	DRIVING BELT
208	4822 528 70851	IDLE WHEEL 1
209	4822 528 70852	IDLE WHEEL 2
211	4822 502 12162	SCREW M2 X 3 (MOTOR)
212	4822 691 30358	CLAMPER ASSY
213	4822 532 52573	PINION GUIDING ASSY
214	4822 402 50312	LEVER SWITCH
216	4822 444 40727	DRAWER
217	4822 502 13886	SCREW PLASTITE 2X6
218	4822 535 93486	PIN FRAME
219	4822 325 50215	SUSPENSION
221	4822 464 51032	FRAME
1800	4822 691 30278	CDM 12.1 ASSY
1802	4822 361 21708	MOTOR ASSY
	4822 502 30735	SCREW 3 X 6 PLASTITE

Figure 1. Portion of Exploded View (CD Short Loader)

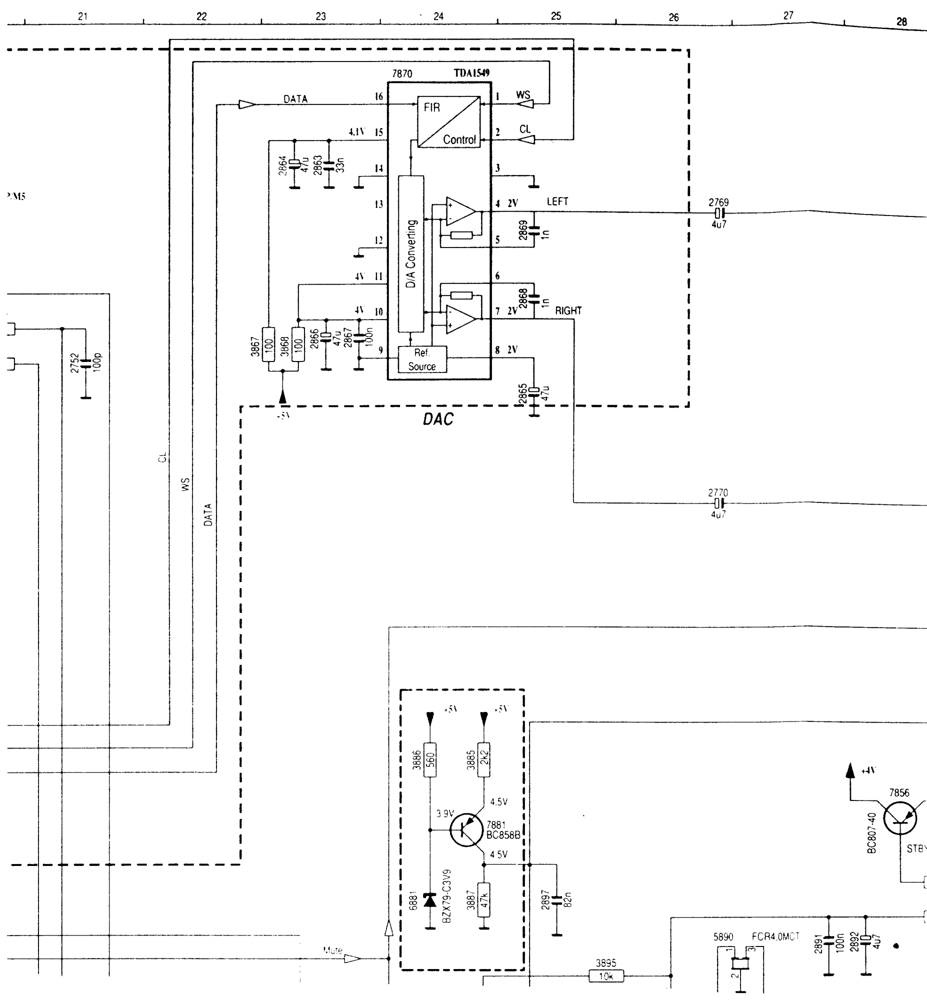

21
22
23
24
25
26
27
28
7870
TDA1549
DATA
FIR
Control
WS
CL
D/A Converting
Ref Source
DAC
LEFT
RIGHT
2769
4u7
2770
4u7
7881
BC858B
7856
3895
10k
5890

Figure 2. Portion of Circuit D

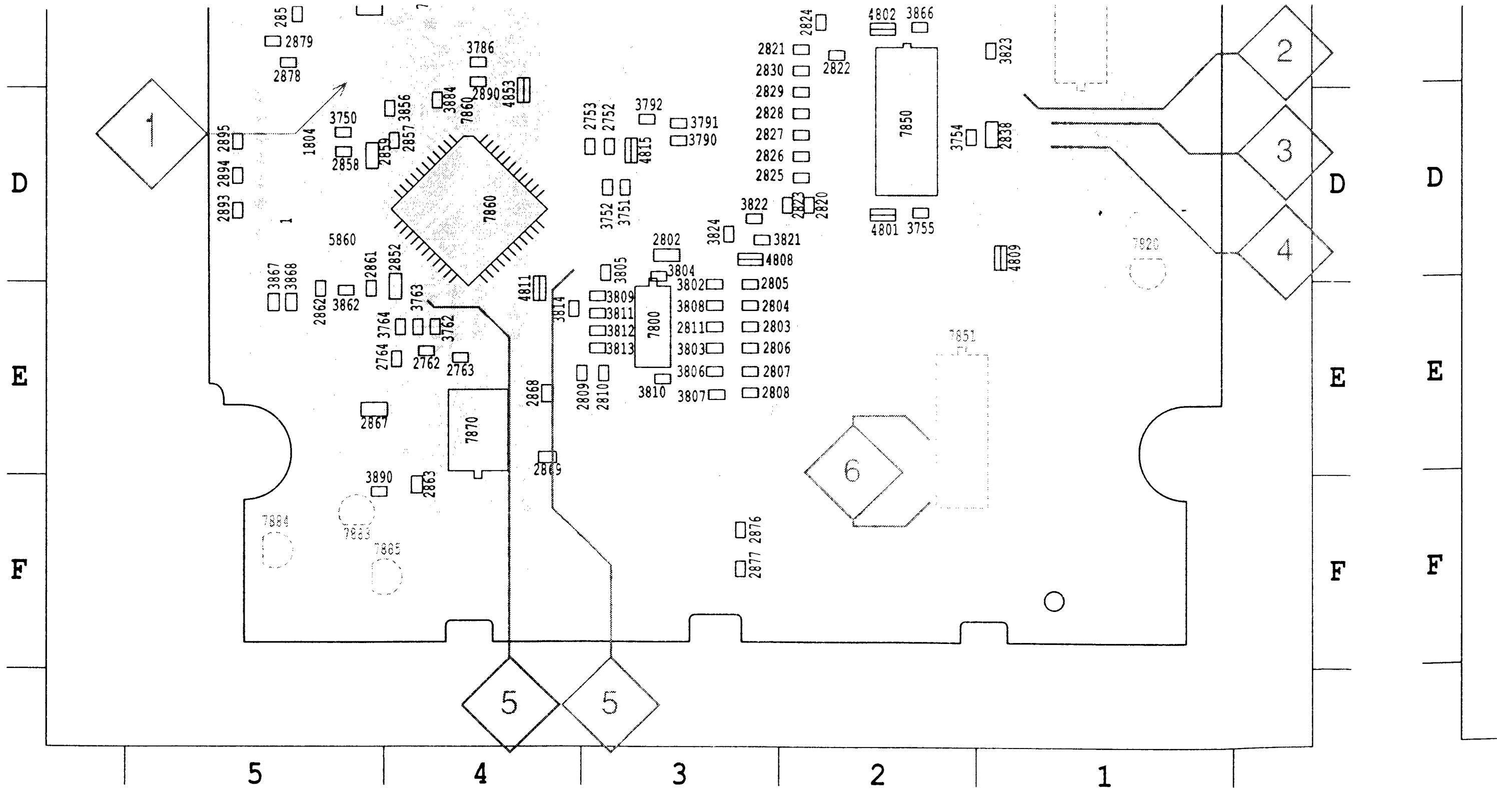
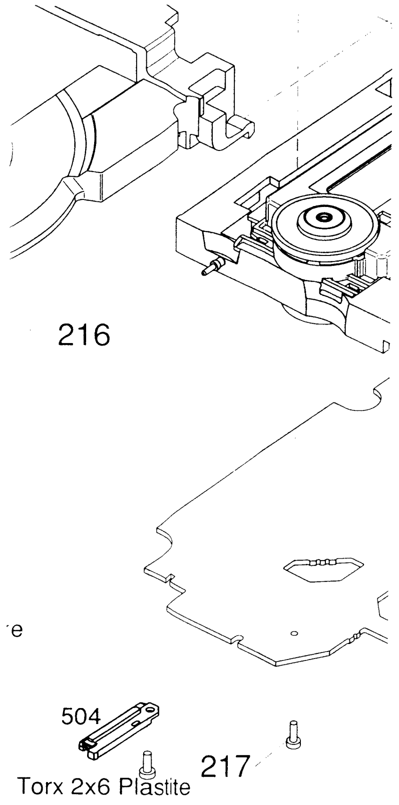

1
2
3
4
5
5
6
D
E
F
D
E
F
5
4
3
2
1
7860
7870
7800
7850
4802
3866
4801
3755

Figure 3. Portion of Chip Layout


216
e
504
217
Torx 2x6 Plastite

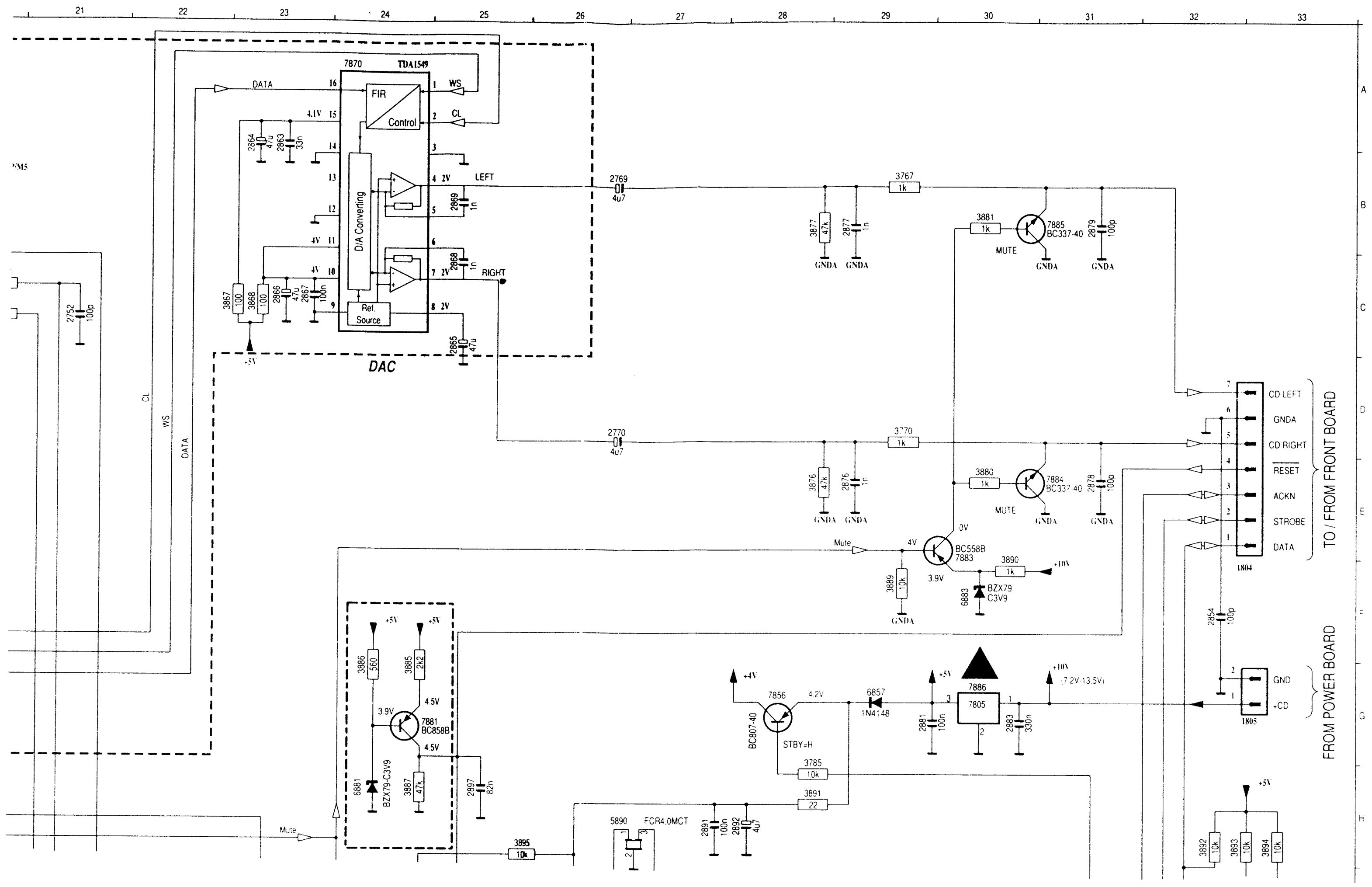

7870
TDA1549
FIR
Control
D/A Converting
Ref Source
DAC
DATA
WS
CL
LEFT
RIGHT
2769
2770
3767
3770
3881
3882
7885
7884
BC337-40
MUTE
GNDA
BC558B
7883
Mute
BZX79 C3V9
6883
CD LEFT
GNDA
CD RIGHT
RESET
ACKN
STROBE
DATA
1804
TO / FROM FRONT BOARD
GND
+CD
1805
FROM POWER BOARD
7886
7805
6857
1N4148
7856
BC807-40
STBY=H
7881
BC858B
BZX79-C3V9
5890
FCR4.0MCT
3895
+5V
+10V

Figure 2. Portion of Circuit Diagram

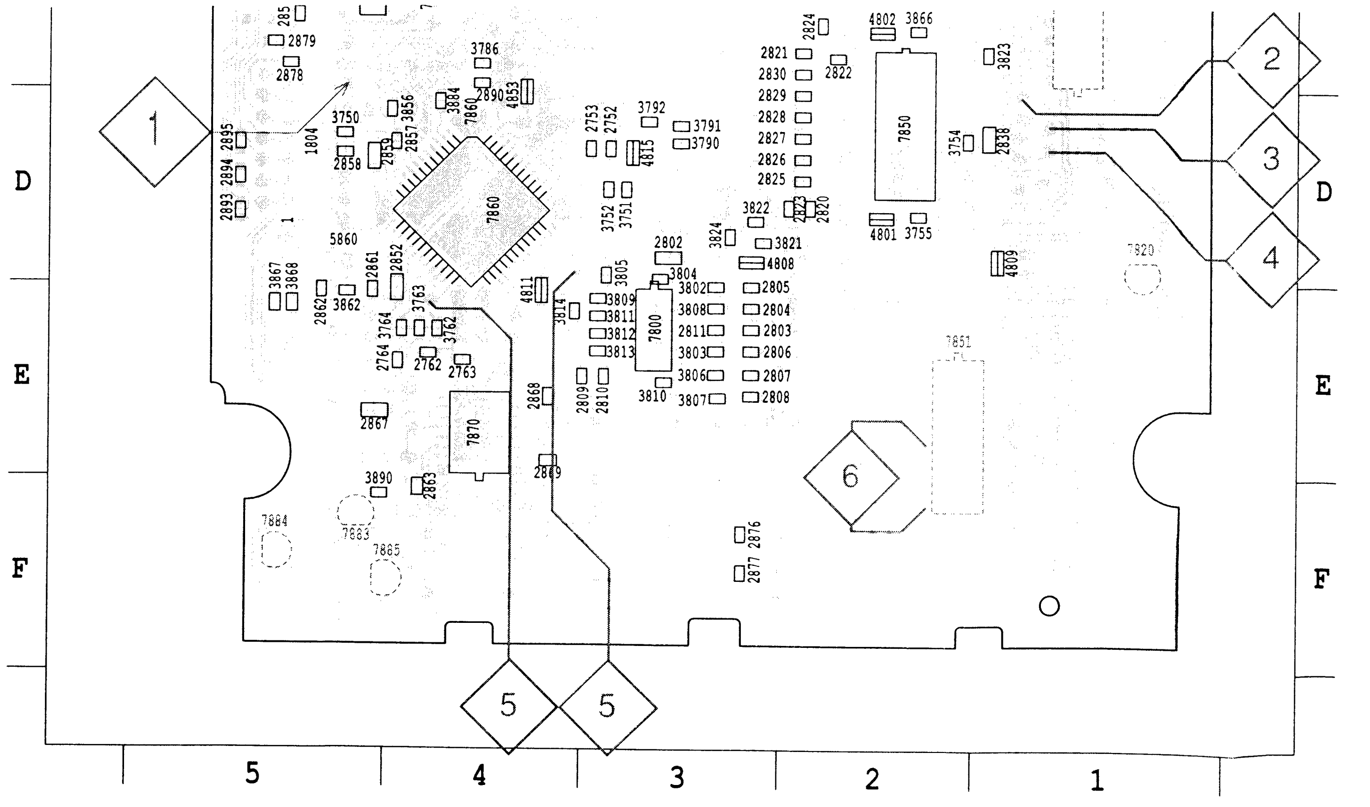

1
2
3
4
5
5
6
D
E
F
5
4
3
2
1
7860
7850
7800
7870
1804
7851

Figure 3. Portion of Chip Layout

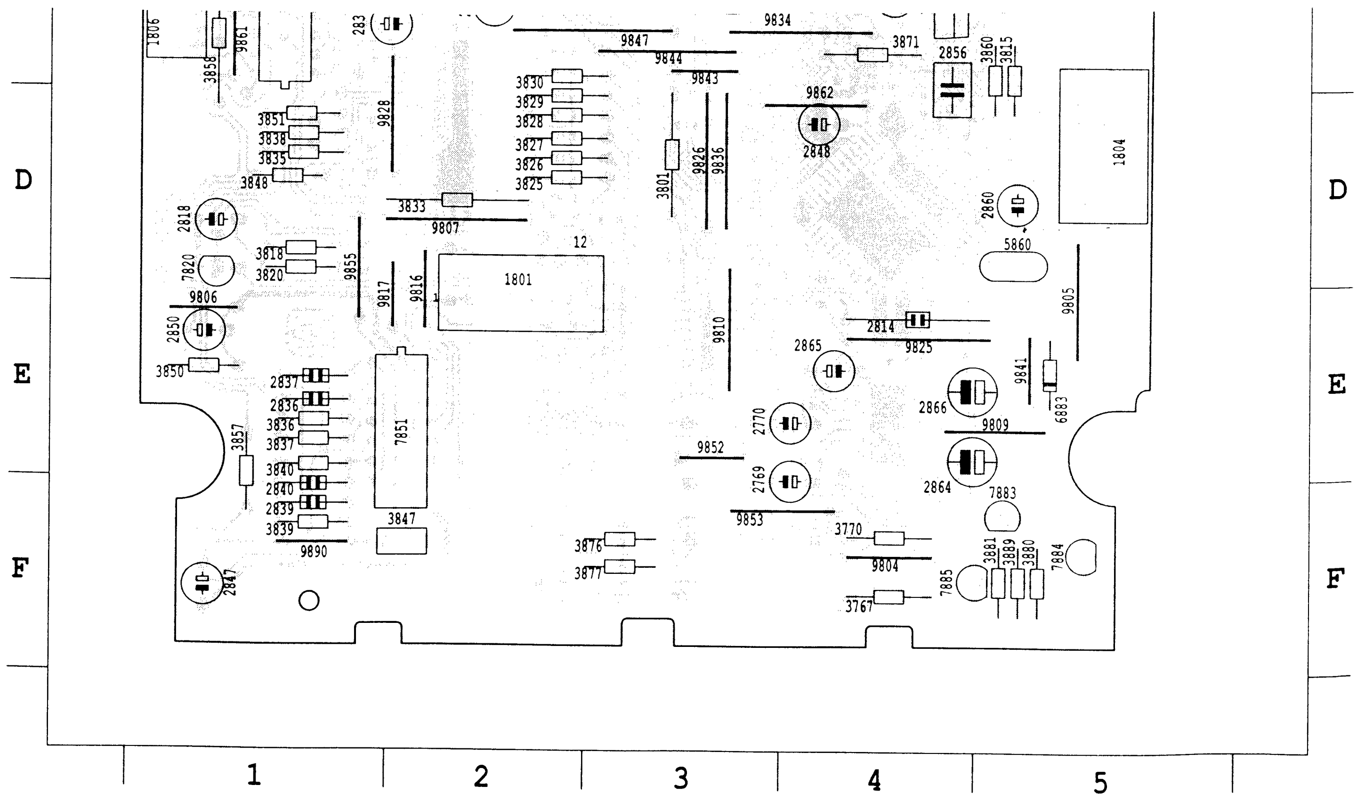
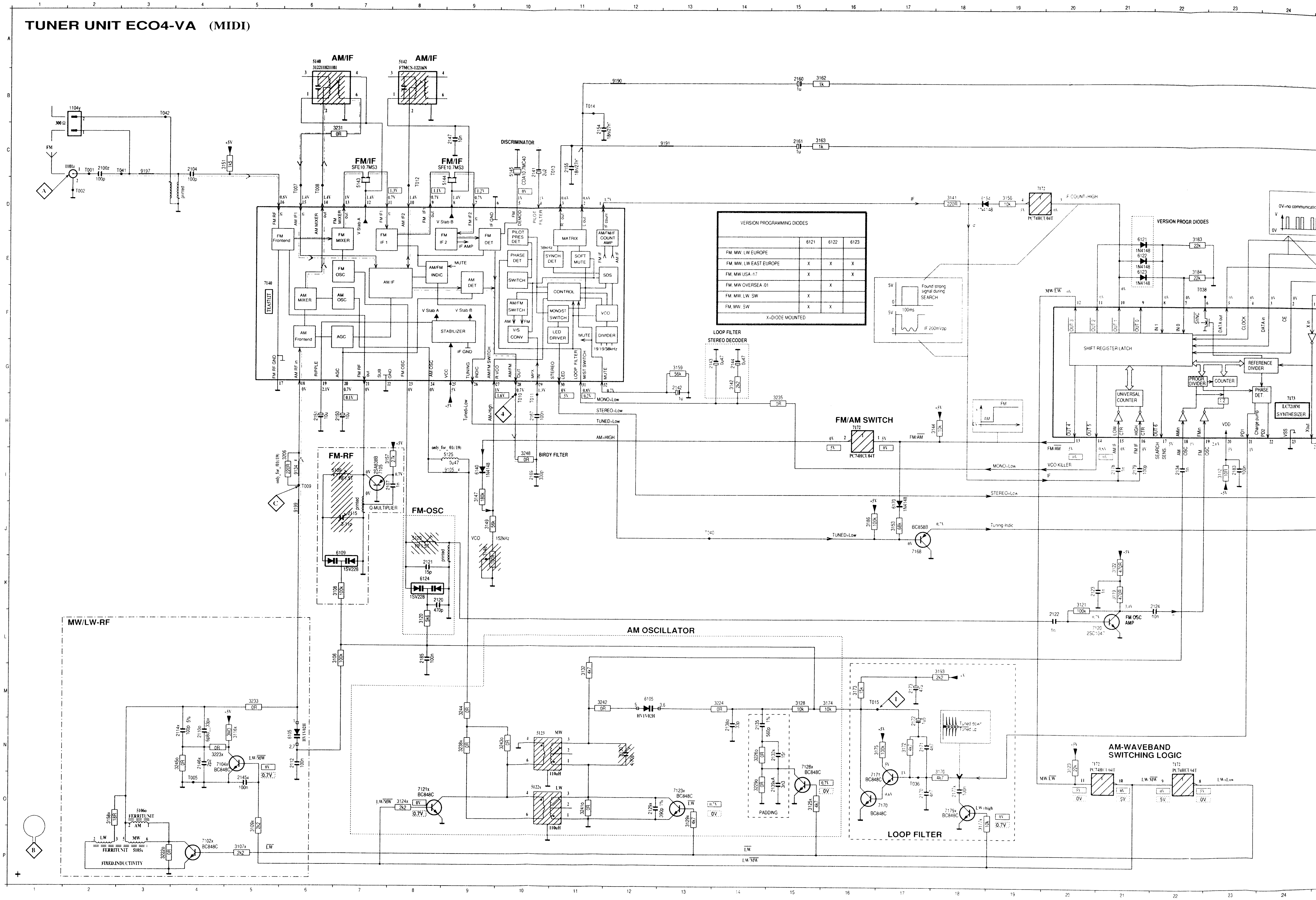

D
E
F
1
2
3
4
5
1804
1801
7851
1806
3847

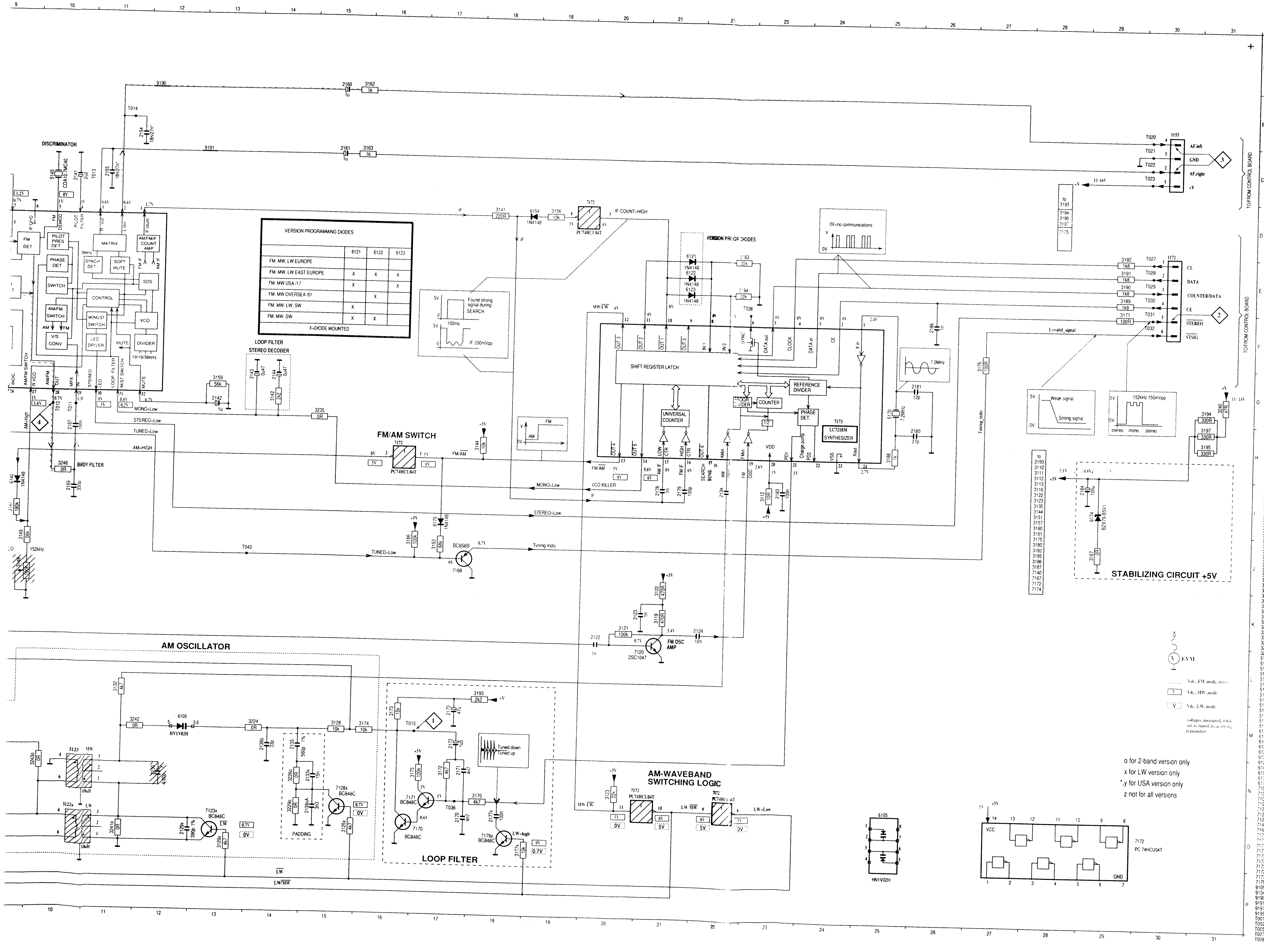
Figure 4. Portion of Component Layout

TUNER UNIT ECO4-VA (MIDI)


AM/IF
5140
3122 118 21101
AM/IF
5142
F7MCS-12216N
FM/IF
SFE10.7MS3
5143
FM/IF
SFE10.7MS3
5144
DISCRIMINATOR
CDA10.7MC40
5145
FM
1101z
300 Ω
1104y
7140
TEA5712T
FM Frontend
FM MIXER
FM OSC
AM MIXER
AM OSC
AM Frontend
AGC
FM IF 1
FM IF 2
FM DET
AM IF
AM/FM INDIC
AM DET
STABILIZER
PILOT PRES DET
PHASE DET
SWITCH
AM/FM SWITCH
V/S CONV
SYNCH DET
SOFT MUTE
MATRIX
AM/FM/IF COUNT AMP
SDS
CONTROL
MONO/ST SWITCH
LED DRIVER
MUTE
VCO
DIVIDER
19/19/38kHz
LOOP FILTER
STEREO DECODER
BIRDY FILTER
FM-RF
Q-MULTIPLIER
2SA838B
1SV228
FM-OSC
VCO
152kHz
MONO=Low
STEREO=Low
TUNED=Low
AM=HIGH
FM/AM SWITCH
7172
PC74HCU04T
F COUNT=HIGH
IF
Found strong signal during SEARCH
100ms
IF 200mVpp
VERSION PROGR DIODES
6121
6122
6123
1N4148
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
PROGR DIVIDER
COUNTER
REFERENCE DIVIDER
PHASE DET
7173
LC7218M
SYNTHESIZER
0V=no communication
VCO KILLER
Tuning-Indic
BC858B
7168
FM OSC AMP
7120
2SC1047
MW/LW-RF
FERRITUNIT
5106a
5105s
FIXED.INDUCTIVITY
BC848C
LW/MW
AM OSCILLATOR
5123
MW
5122
LW
110uH
BV1V02H
PADDING
LOOP FILTER
Tuned=low
AM-WAVEBAND SWITCHING LOGIC
LW=Low

VERSION PROGRAMMING DIODES	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW	X		
FM, MW, SW	X	X	

X=DIODE MOUNTED


DISCRIMINATOR
FM DET
PILOT PRES DET
PHASE DET
SWITCH
AM/FM SWITCH
V/S CONV
MATRIX
SYNCH DET
SOFT MUTE
CONTROL
MONO/ST SWITCH
LED DRIVER
MUTE
DIVIDER
VCO
SDS
AM/FM/IF COUNT AMP
19/19/38kHz
LOOP FILTER
STEREO DECODER
BIRDY FILTER
152kHz
FM/AM SWITCH
PC74HCU04T
MONO=Low
STEREO=Low
TUNED=Low
AM=HIGH
IF COUNT=HIGH
VCO KILLER
Tuning indic
BC858B
7168
Found strong signal during SEARCH
100ms
IF 200mVpp
VERSION PROGR DIODES
1N4148
0V=no communications
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
COUNTER
REFERENCE DIVIDER
PHASE DET.
LC7218M SYNTHESIZER
7173
7.2MHz
CL
DATA
COUNTER/DATA
CE
STEREO
STSIG
AF.left
GND
AF.right
TO/FROM CONTROL BOARD
L=valid_signal
Weak signal
Strong signal
152kHz 150mVpp
stereo mono stereo
STABILIZING CIRCUIT +5V
BZX79-B5V1
FM OSC AMP
7120
2SC1047
AM OSCILLATOR
HV1V02H
PADDING
LOOP FILTER
Tuned down
Tuned up
AM-WAVEBAND SWITCHING LOGIC
LW=high
LW=Low
HN1V02H
VCC
GND
7172
PC 74HCU04T

VERSION PROGRAMMING DIODES

	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW	X		
FM, MW, SW	X	X	

X=DIODE MOUNTED

EVM

⋯ Vdc...FM..mode..stereo

V Vdc...MW..mode

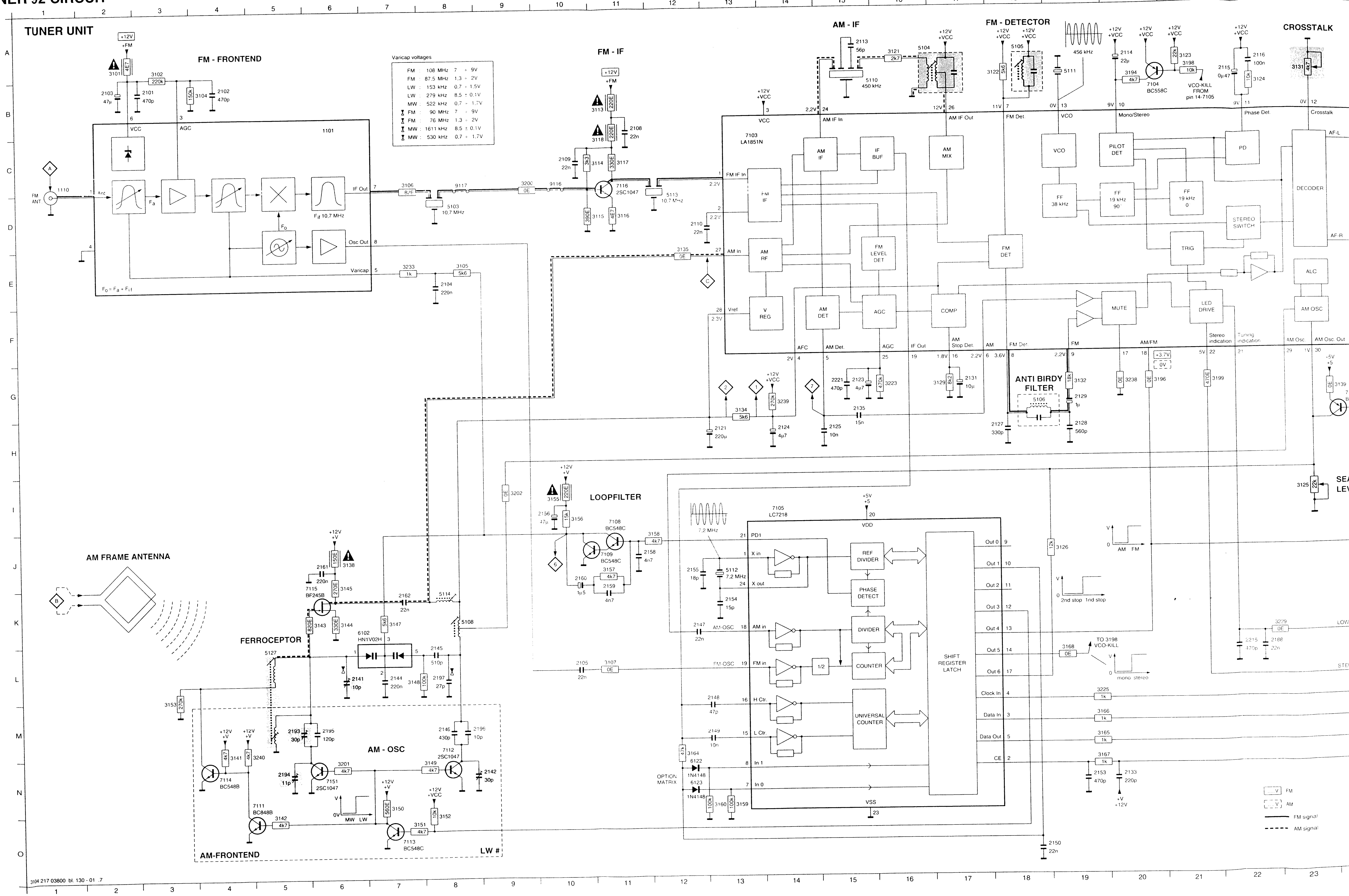
V Vdc...LW..mode

voltages..measured..while set..is..tuned..to..a..strong transmitter

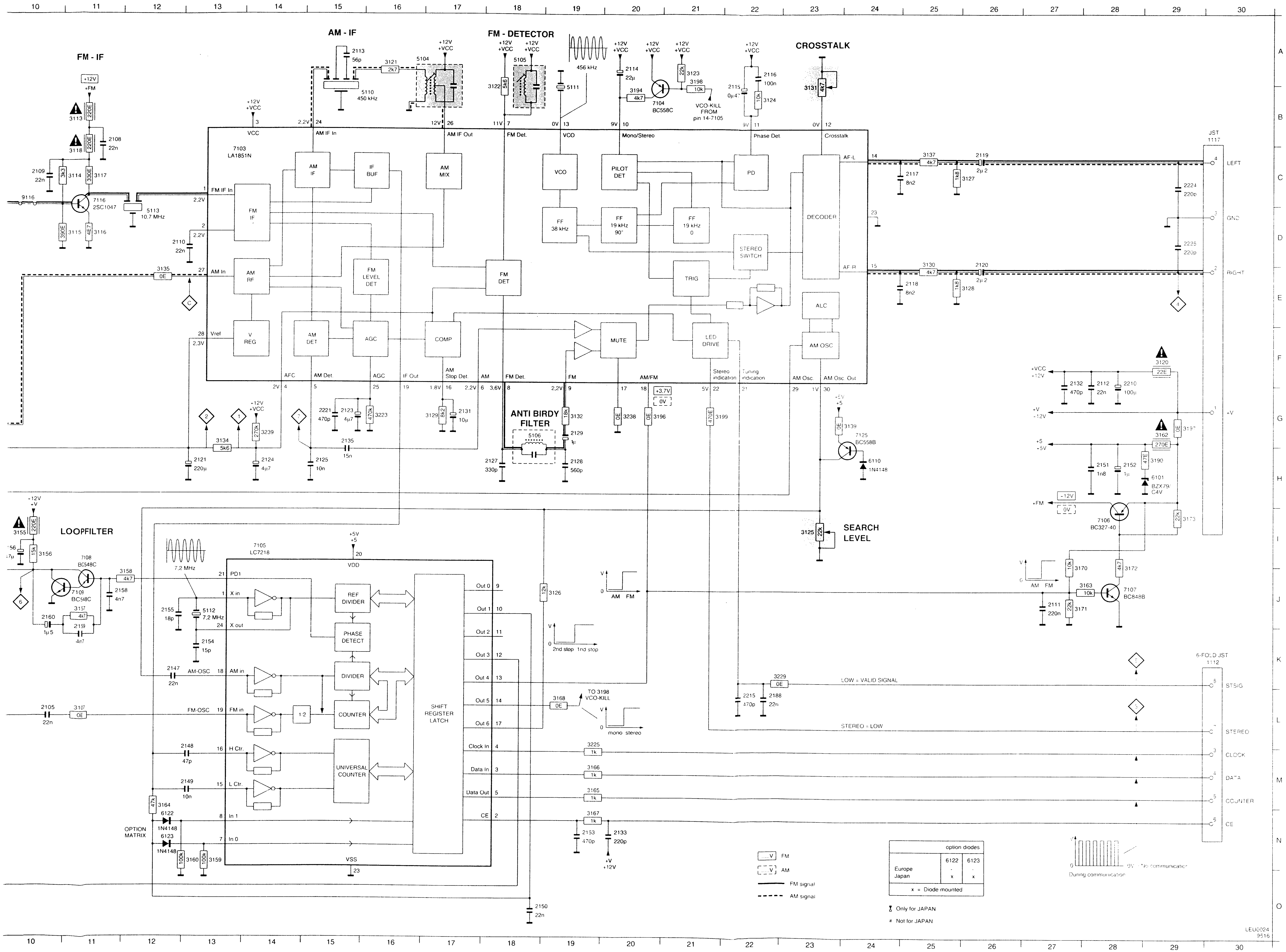
o for 2-band version only
x for LW version only
*,y for USA version only
z not for all versions

1101z	C 1
1104y	C 2
1153	B30
1172	D30
2100z	C 2
2104	C 4
2107	I 8
2110o	N 4
2112	N 6
2114x	N 4
2115	J 7
2120	K 8
2121	K 8
2122	K20
2123	K20
2124	K22
2129x	O12
2130	N12
2133x	N15
2134	I22
2135	N14
2138o	N14
2139x	O15
2141	C10
2142	G13
2143	G13
2144	G14
2145x	O 5
2146x	N 4
2147	C 9
2150	H 7
2151	H 6
2154	C11
2155	C12
2160	B15
2161	C15
2167	H10
2169	I10
2170	O17
2171	N17
2172	M17
2173	M17
2177x	O18
2178	I21
2179	I21
2180	H25
2181	G25
2183	I23
2184	I29
2185	L 8
2186	F26
3106	L 7
3107x	P 5
3108	K 7
3109x	O 5
3112	I23
3116x	L 4
3119	K21
3120	L 8
3121	K20
3122	K21
3123	N20
3124x	O 8
3125x	O15
3128	M15
3129x	O13
3132	M12
3141	D18
3142	G14
3144	H18
3147	I 9
3148	J 9
3149	J 9
3151	C 4
3153	J17
3156	D19
3157	I 7
3158x	O 2
3159	G13
3162	B15
3163	C15
3167	J29
3170	N18
3171	F29
3172	N17
3173	M16
3174	M16
3175	N17
3176	F27
3177x	O18
3183	E22
3184	E22
3186	J14
3188	H25
3189	E29
3190	E29
3191	E29
3192	E29
3193	M18
3194	G31
3195	H31
3197	H31
3206	I 6
3222o	P 3
3223x	N 4
3224	M14
3226o	N14
3229o	O14
3231	C 7
3233	M 5
3235	H15
3238x	N 9
3240	G31
3241o	O11
3242	N11
3243o	N10
3244	M 9
3245o	N 4
3248	I10
5105x	P 2
5106o	O 3
5109	I 7
5120	J 8
5122x	O10
5123	N10
5125	I 9
5140	A 6
5142	A 8
5143	D 7
5144	D 9
5145	C10
5170	G25
5105	M12
6105	M12
6105	N6
6109	J 7
6121	E21
6122	E21
6123	E21
6124	K 8
6140	I 9
6154	D18
6170	J17
6174	I29
7102x	P 4
7104x	N 5
7105	I 7
7120	L20
7121x	O 8
7123x	O13
7128x	N15
7140	E 5
7168	J17
7170	O17
7171	O17
7172	H16
7172	D20
7172	O20
7172	N22
7172	N20
7172	O22
7173	H24
7179x	O18
9105	I 9
9134	I 6
9190	B12
9191	C13
9197	C 3
9199	J 6
T001	C 2
T002	D 2
T005	O 4
T007	D 6
T008	D 6
T009	I 6
T010	H10
T011	H10
T012	C 8
T013	C11
T014	B11
T015	M16
T020	B29
T021	C29
T022	C29
T023	C29
T027	D30
T028	E30
T029	E30
T030	E30
T031	E30
T032	F30
T036	O17
T038	F22
T040	J13
T041	C 2
T042	B 3

TUNER 92 CIRCUIT



TUNER UNIT
FM - FRONTEND
1101
VCC
AGC
IF Out
Osc Out
Varicap
Fo = Fa + Fif
Fif 10,7 MHz
FM ANT
1110
Varicap voltages
FM : 108 MHz 7 ÷ 9V
FM : 87.5 MHz 1,3 ÷ 2V
LW : 153 kHz 0,7 ÷ 1.5V
LW : 279 kHz 8.5 ± 0.1V
MW : 522 kHz 0,7 ÷ 1.7V
FM : 90 MHz 7 ÷ 9V
FM : 76 MHz 1.3 ÷ 2V
MW : 1611 kHz 8.5 ± 0.1V
MW : 530 kHz 0,7 ÷ 1.7V
FM - IF
7116 2SC1047
5103 10,7 MHz
5113 10,7 MHz
AM - IF
5110 450 kHz
FM - DETECTOR
456 kHz
7104 BC558C
VCO-KILL FROM pin 14-7105
CROSSTALK
7103 LA1851N
FM IF In
AM IF In
AM IF Out
FM Det
VCO
Mono/Stereo
Phase Det.
Crosstalk
AM IF
IF BUF
AM MIX
PILOT DET
PD
DECODER
FM IF
FF 38 kHz
FF 19 kHz 90°
FF 19 kHz 0
STEREO SWITCH
AM RF
FM LEVEL DET
FM DET
TRIG
ALC
V REG
AM DET
AGC
COMP
MUTE
LED DRIVE
AM OSC
AF-L
AF-R
AM In
Vref
AFC
AM Det.
IF Out
AM Stop Det.
AM
FM Det.
FM
AM/FM
Stereo indication
Tuning indication
AM Osc
AM Osc. Out
ANTI BIRDY FILTER
5106
LOOPFILTER
7108 BC548C
7109 BC548C
7105 LC7218
VDD
PD1
X in
X out
AM in
FM in
H Ctr.
L Ctr.
In 1
In 0
VSS
REF DIVIDER
PHASE DETECT
DIVIDER
COUNTER
1/2
UNIVERSAL COUNTER
SHIFT REGISTER LATCH
Out 0
Out 1
Out 2
Out 3
Out 4
Out 5
Out 6
Clock In
Data In
Data Out
CE
5112 7.2 MHz
7.2 MHz
AM-OSC
FM-OSC
OPTION MATRIX
6122 1N4148
6123 1N4148
AM FM
2nd stop 1nd stop
TO 3198 VCO-KILL
mono stereo
AM FRAME ANTENNA
FERROCEPTOR
5127
7115 BF245B
6102 HN1V02H
5114
5108
AM - OSC
7112 2SC1047
7151 2SC1047
7114 BC548B
7111 BC848B
7113 BC548C
MW LW
AM-FRONTEND
LW #
FM
AM
FM signal
AM signal
SEA
LEV
LOW
STE

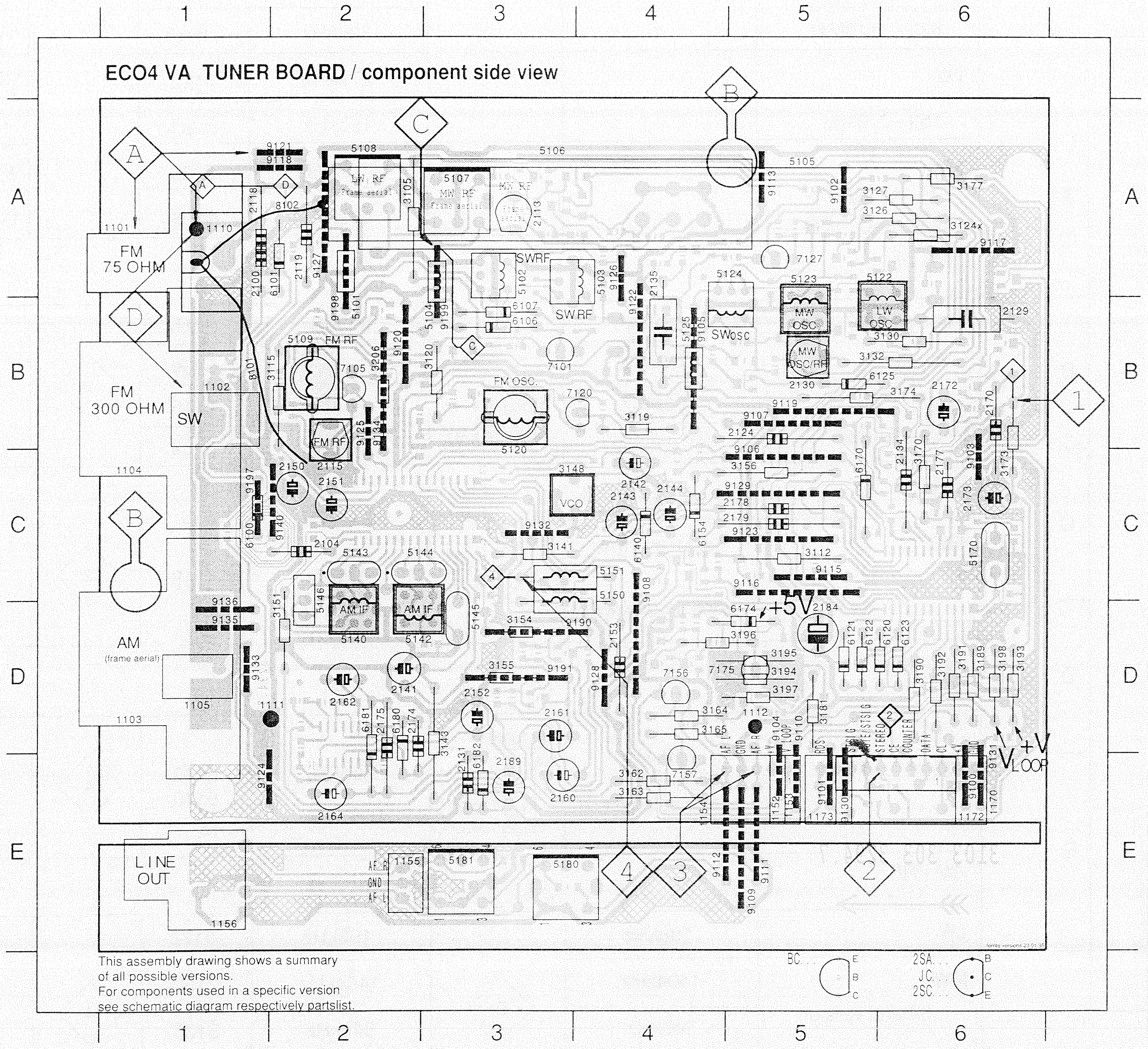

FM - IF
AM - IF
FM - DETECTOR
CROSSTALK
LOOPFILTER
ANTI BIRDY FILTER
SEARCH LEVEL
7103 LA1851N
VCC
AM IF In
AM IF Out
FM Det.
VCO
Mono/Stereo
Phase Det.
Crosstalk
FM IF In
AM In
Vref
AM IF
IF BUF
AM MIX
VCO
PILOT DET
PD
DECODER
FF 38 kHz
FF 19 kHz 90°
FF 19 kHz 0
FM IF
AM RF
FM LEVEL DET
FM DET
TRIG
STEREO SWITCH
ALC
V REG
AM DET
AGC
COMP
MUTE
LED DRIVE
AM OSC
AFC
AM Det.
AGC
IF Out
AM Stop Det.
AM
FM Det.
FM
AM/FM
Stereo indication
Tuning indication
AM Osc
AM Osc. Out
AF-L
AF-R
456 kHz
5110 450 kHz
5113 10.7 MHz
7116 2SC1047
7104 BC558C
VCO-KILL FROM pin 14-7105
7105 LC7218
VDD
PD1
X in
X out
AM in
FM in
H Ctr.
L Ctr.
In 1
In 0
VSS
REF DIVIDER
PHASE DETECT
DIVIDER
COUNTER
1:2
UNIVERSAL COUNTER
SHIFT REGISTER LATCH
Out 0
Out 1
Out 2
Out 3
Out 4
Out 5
Out 6
Clock In
Data In
Data Out
CE
7.2 MHz
5112 7.2 MHz
AM-OSC
FM-OSC
TO 3198 VCO-KILL
2nd stop 1nd stop
mono stereo
AM FM
7108 BC548C
7109 BC548C
7125 BC558B
7106 BC327-40
7107 BC848B
6110 1N4148
6101 BZX79/C4V
6122 1N4148
6123 1N4148
OPTION MATRIX
JST 1117
LEFT
GND
RIGHT
+V
6-FOLD JST 1112
STSIG
STEREO
CLOCK
DATA
COUNTER
CE
LOW = VALID SIGNAL
STEREO = LOW
FM
AM
FM signal
AM signal
option diodes
6122
6123
Europe
Japan
x = Diode mounted
Only for JAPAN
Not for JAPAN
No communication
During communication
LEU0024
9516

1101	B6
1110	C1
1112	K30
1117	B30
2101	B3
2102	B4
2103	B2
2104	E8
2105	L10
2108	B11
2109	C10
2110	D12
2111	J27
2112	F28
2113	A15
2114	A20
2115	B22
2116	A22
2117	C25
2118	E25
2119	C26
2120	D26
2121	H13
2123	G15
2124	H14
2125	H15
2127	H18
2128	H19
2129	G19
2131	G17
2132	F27
2133	N20
2135	G15
2141	L6
2142	N9
2144	L7
2145	L8
2146	M8
2147	K12
2148	M12
2149	M12
2150	O18
2151	H28
2152	H28
2153	N19
2154	K13
2155	J12
2156	I10
2158	J11
2159	K11
2160	J10
2161	J6
2162	K7
2188	L22
2193	M5
2194	N5
2195	M6
2196	M8
2197	L8
2210	F28
2215	L22
2221	G15
2224	C29
2225	D29
3101	A2
3102	A3
3104	B4
3105	E6
3106	C7
3107	L11
3113	B11
3114	C11
3115	D11
3116	D11
3117	C11
3118	C11
3120	F29
3121	A16
3122	B18
3123	A21
3124	B22
3125	I23
3126	J19
3127	C26
3128	E26
3129	G17
3130	D25
3131	B23
3132	G19
3134	G13
3135	E12
3137	C25
3138	J6
3139	G24
3141	N4
3142	D6
3143	K6
3144	K6
3145	K6
3147	K7
3148	L7
3149	N7
3150	N7
3151	O7
3152	O8
3153	M3
3155	I10
3156	I10
3157	J11
3158	J11
3159	N13
3160	N13
3162	G29
3163	J27
3164	N12
3165	M19
3166	M19
3167	N19
3168	L19
3170	J27
3171	J27
3172	J28
3173	I29
3190	H29
3194	B20
3196	G20
3197	G29
3198	A21
3199	G21
3200	C9
3201	N6
3202	I9
3223	G16
3225	L19
3229	K22
3233	E7
3238	G20
3239	G14
3240	N4
5103	D8
5104	A16
5105	A18
5106	G18
5108	K8
5110	B15
5111	B19
5112	J13
5113	D12
5114	K8
5127	L5
6101	H29
6102	K6
6110	H24
6122	N12
6123	N12
7103	C13
7104	B20
7105	I14
7106	I28
7107	J28
7108	I11
7109	J11
7111	N4
7112	M8
7113	O7
7114	N4
7115	K5
7116	C11
7125	G24
7151	N6
9116	C10
9117	C8

1101 A 1	1173 E 5	2142 C 4	2175 D 2	3127 A 6	3173 B 6	5101 A 2	5142 D 2	6121 D 5	7156 D 4	9110 E 5	9126 A 4	9198 A 2
1102 B 1	2100 A 1	2143 C 4	2177 C 6	3130 B 6	3174 B 5	5102 A 3	5143 C 2	6122 D 5	7157 E 4	9111 E 5	9127 A 2	9199 A 3
1103 D 1	2104 C 2	2144 C 4	2178 C 5	3132 B 6	3177 A 6	5103 A 3	5144 C 2	6123 D 6	7175 D 5	9112 E 4	9128 D 4	
1104 B 1	2106 B 4	2150 C 2	2179 C 5	3141 C 3	3181 D 5	5104 A 3	5145 D 3	6125 B 5	8101 B 1	9113 A 5	9129 C 5	
1105 D 1	2113 A 3	2151 C 2	2184 D 5	3143 D 3	3189 D 6	5105 A 4	5146 D 2	6140 C 4	8102 A 1	9115 C 5	9130 E 5	
1110 A 1	2115 B 2	2152 D 3	2189 E 3	3148 C 3	3190 D 6	5106 A 4	5150 D 3	6154 C 4	9100 E 6	9116 C 5	9131 E 6	
1111 D 2	2118 A 1	2153 D 4	2190 A 2	3151 D 2	3191 D 6	5107 A 3	5151 C 3	6170 C 5	9101 E 5	9117 A 6	9132 C 3	
1112 D 5	2119 A 2	2160 E 3	2191 A 6	3154 D 3	3192 D 6	5108 A 2	5170 C 6	6174 D 5	9102 A 5	9118 A 2	9133 D 1	
1152 E 5	2124 B 5	2161 D 3	3105 A 2	3155 D 3	3193 D 6	5109 B 2	5180 E 3	6180 D 2	9103 C 6	9119 B 5	9134 B 2	
1153 E 5	2129 B 6	2162 D 2	3112 C 5	3156 C 5	3194 D 5	5120 B 3	5181 E 3	6181 D 2	9104 E 5	9120 B 2	9135 D 1	
1154 E 4	2130 B 5	2164 E 2	3115 B 2	3162 E 4	3195 D 5	5122 B 6	6100 C 1	6182 E 3	9105 B 4	9121 A 2	9136 D 1	
1155 E 2	2131 E 3	2170 B 6	3119 B 4	3163 E 4	3196 D 4	5123 B 5	6101 A 2	7101 B 3	9106 C 5	9122 B 4	9140 C 2	
1156 E 1	2134 C 6	2172 B 6	3120 B 3	3164 D 4	3197 D 5	5124 B 5	6106 B 3	7105 B 2	9107 B 5	9123 C 5	9190 D 3	
1170 E 6	2135 B 4	2173 C 6	3124 A 6	3165 D 4	3198 D 6	5125 B 4	6107 B 3	7120 B 4	9108 D 4	9124 E 1	9191 D 3	
1172 E 6	2141 D 2	2174 D 2	3126 A 6	3170 C 6	3206 B 2	5140 D 2	6120 D 6	7127 A 5	9109 E 5	9125 B 2	9197 C 1	

o for AM-version only
x for LW-version only
y for USA version only
z not for all versions

ECO4 VA TUNER BOARD / component side view

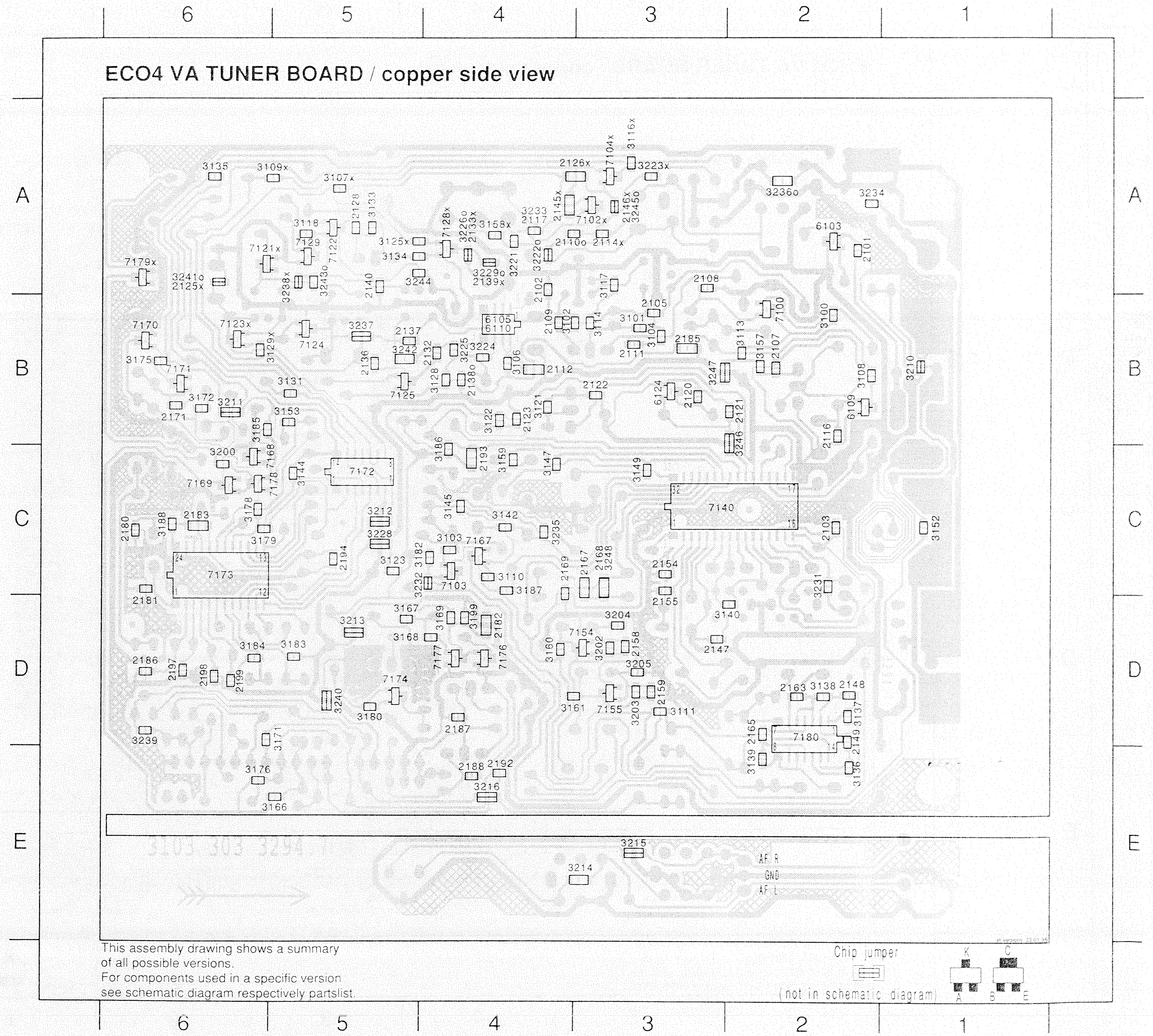


This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

2101 A 2	2122 B 3	2148 D 2	2183 C 6	3104 B 3	3125x A 5	3147 C 4	3175 B 6	3203 D 3	3226o A 4	3243o A 5	7121x A 6	7172 C 5
2102 A 4	2123 B 4	2149 D 2	2185 B 3	3106 B 4	3128 B 4	3149 C 3	3176 E 6	3204 D 3	3228 C 5	3244 A 5	7122 A 5	7173 C 6
2103 C 2	2125x A 6	2154 C 3	2186 D 6	3107x A 5	3129x B 6	3152 C 1	3178 C 6	3205 D 3	3229o A 4	3245o A 3	7123x B 6	7174 D 5
2105 B 3	2126x A 3	2155 C 3	2187 D 4	3108 B 2	3131 B 5	3153 B 5	3179 C 6	3210 B 1	3231 C 2	3246 B 2	7124 B 5	7176 D 4
2107 B 2	2128 A 5	2158 D 3	2188 E 4	3109x A 5	3133 A 5	3157 B 2	3180 D 5	3211 B 6	3232 C 4	3247 B 3	7125 B 5	7177 D 4
2108 A 3	2132 B 4	2159 D 3	2192 E 4	3110 C 4	3134 A 5	3158x A 4	3182 C 4	3212 C 5	3233 A 4	3248 C 3	7128x A 4	7178 C 6
2109 B 4	2133x A 4	2163 D 2	2193 C 4	3111 D 3	3135 A 6	3159 C 4	3183 D 5	3213 D 5	3234 A 2	6103 A 2	7129 A 5	7179x A 6
2110o A 4	2136 B 5	2165 E 2	2194 C 5	3113 B 2	3136 E 2	3160 D 4	3184 D 6	3214 E 3	3235 C 4	6105 B 4	7140 C 2	7180 D 2
2111 B 3	2137 B 5	2167 C 3	2197 D 6	3114 B 3	3137 D 2	3161 D 3	3185 B 6	3215 E 3	3236o A 2	6109 B 2	7154 D 3	
2112 B 4	2138o B 4	2168 C 3	2198 D 6	3116x A 3	3138 D 2	3166 E 5	3186 C 4	3216 E 4	3237 B 5	6110 B 4	7155 D 3	
2114x A 3	2139x A 4	2169 C 4	2199 D 6	3117 A 3	3139 D 2	3167 D 5	3187 C 4	3221 A 4	3238x A 5	6124 B 3	7167 C 4	
2116 B 2	2140 A 5	2171 B 6	3100 B 2	3118 A 5	3140 D 2	3168 D 4	3188 C 6	3222o A 4	3239 D 6	7100 B 2	7168 C 6	
2117 A 4	2145x A 4	2180 C 6	3101 B 3	3121 B 4	3142 C 4	3169 D 4	3199 D 4	3223x A 3	3240 D 5	7102x A 3	7169 C 6	
2120 B 3	2146x A 3	2181 C 6	3102 B 3	3122 B 4	3144 C 5	3171 D 6	3200 C 6	3224 B 4	3241o A 6	7103 C 4	7170 B 6	
2121 B 2	2147 D 3	2182 D 4	3103 C 4	3123 C 5	3145 C 4	3172 B 6	3202 D 3	3225 B 4	3242 B 5	7104x A 3	7171 B 6	

o for AM-version only
x for LW-version only
y for USA version only
z not for all versions

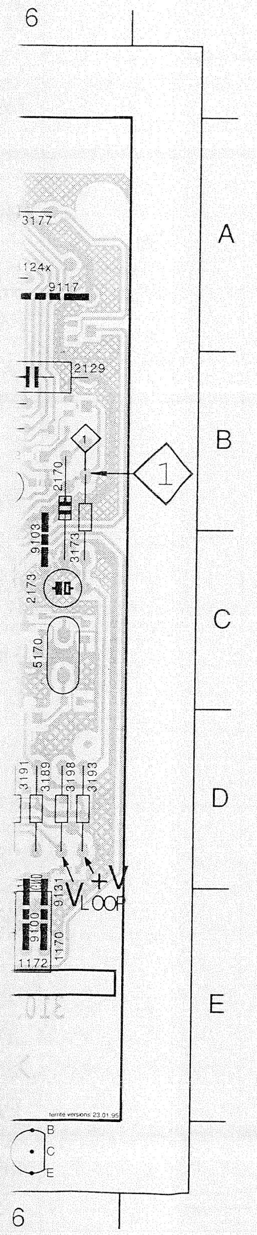
ECO4 VA TUNER BOARD / copper side view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

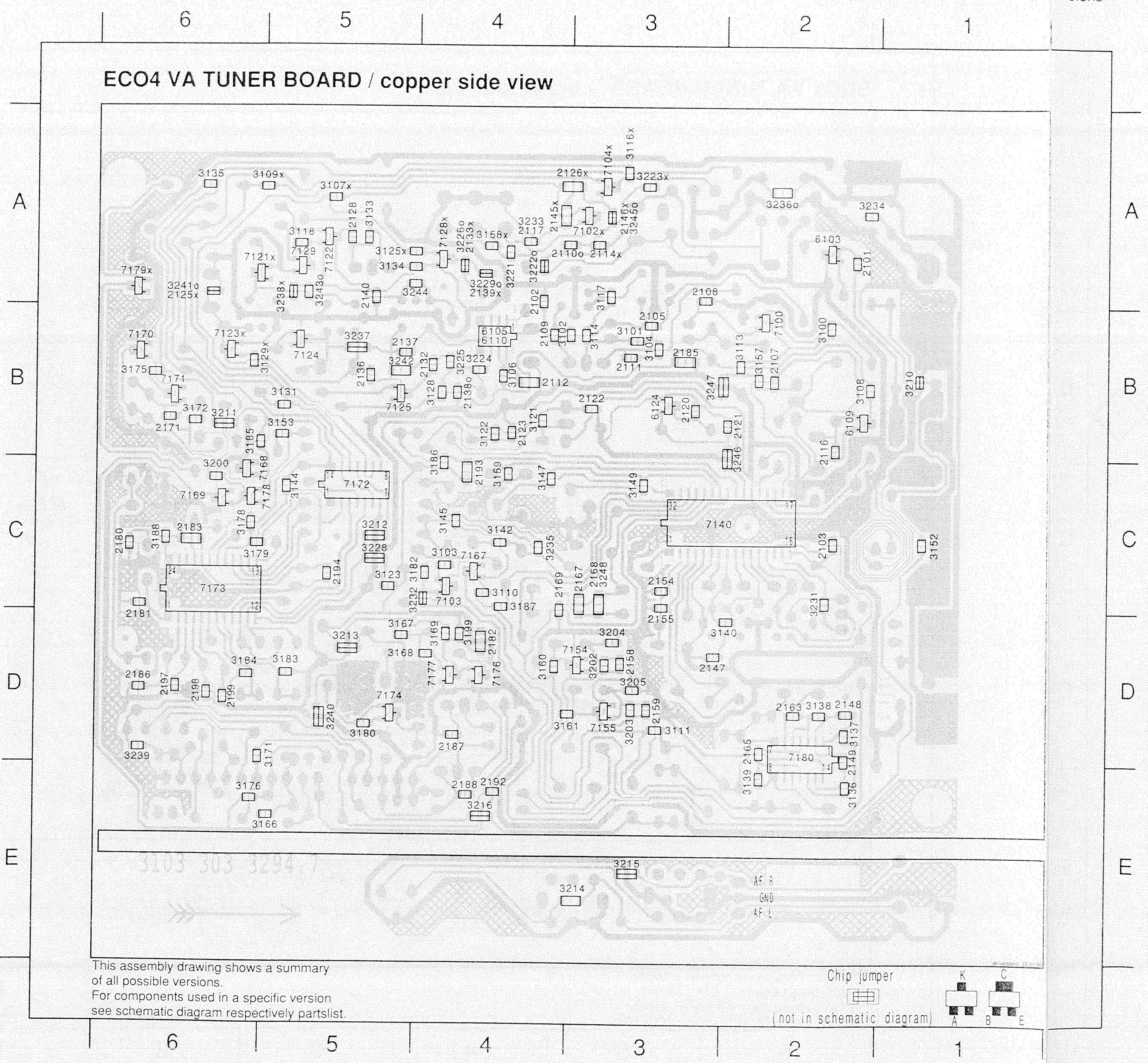
9198	A 2
9199	A 3

o for AM-version only
x for LW-version only
y for USA version only
z not for all versions



2101 A 2	2122 B 3	2148 D 2	2183 C 6	3104 B 3	3125x A 5	3147 C 4	3175 B 6	3203 D 3	3226o A 4	3243o A 5	7121x A 6	7172 C 5
2102 A 4	2123 B 4	2149 D 2	2185 B 3	3106 B 4	3128 B 4	3149 C 3	3176 E 6	3204 D 3	3228 C 5	3244 A 5	7122 A 5	7173 C 6
2103 C 2	2125x A 6	2154 C 3	2186 D 6	3107x A 5	3129x B 6	3152 C 1	3178 C 6	3205 D 3	3229o A 4	3245o A 3	7123x B 6	7174 D 5
2105 B 3	2126x A 3	2155 C 3	2187 D 4	3108 B 2	3131 B 5	3153 B 5	3179 C 6	3210 B 1	3231 C 2	3246 B 2	7124 B 5	7176 D 4
2107 B 2	2128 A 5	2158 D 3	2188 E 4	3109x A 5	3133 A 5	3157 B 2	3180 D 5	3211 B 6	3232 C 4	3247 B 3	7125 B 5	7177 D 4
2108 A 3	2132 B 4	2159 D 3	2192 E 4	3110 C 4	3134 A 5	3158x A 4	3182 C 4	3212 C 5	3233 A 4	3248 C 3	7128x A 4	7178 C 6
2109 B 4	2133x A 4	2163 D 2	2193 C 4	3111 D 3	3135 A 6	3159 C 4	3183 D 5	3213 D 5	3234 A 2	6103 A 2	7129 A 5	7179x A 6
2110o A 4	2136 B 5	2165 E 2	2194 C 5	3113 B 2	3136 E 2	3160 D 4	3184 D 6	3214 E 3	3235 C 4	6105 B 4	7140 C 2	7180 D 2
2111 B 3	2137 B 5	2167 C 3	2197 D 6	3114 B 3	3137 D 2	3161 D 3	3185 B 6	3215 E 3	3236o A 2	6109 B 2	7154 D 3	
2112 B 4	2138o B 4	2168 C 3	2198 D 6	3116x A 3	3138 D 2	3166 E 5	3186 C 4	3216 E 4	3237 B 5	6110 B 4	7155 D 3	
2114x A 3	2139x A 4	2169 C 4	2199 D 6	3117 A 3	3139 D 2	3167 D 5	3187 C 4	3221 A 4	3238x A 5	6124 B 3	7167 C 4	
2116 B 2	2140 A 5	2171 B 6	3100 B 2	3118 A 5	3140 D 2	3168 D 4	3188 C 6	3222o A 4	3239 D 6	7100 B 2	7168 C 6	
2117 A 4	2145x A 4	2180 C 6	3101 B 3	3121 B 4	3142 C 4	3169 D 4	3199 D 4	3223x A 3	3240 D 5	7102x A 3	7169 C 6	
2120 B 3	2146x A 3	2181 C 6	3102 B 3	3122 B 4	3144 C 5	3171 D 6	3200 C 6	3224 B 4	3241o A 6	7103 C 4	7170 B 6	
2121 B 2	2147 D 3	2182 D 4	3103 C 4	3123 C 5	3145 C 4	3172 B 6	3202 D 3	3225 B 4	3242 B 5	7104x A 3	7171 B 6	

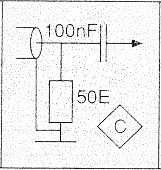
o for AM-version only
x for LW-version only
y for USA version only
z not for all versions



ECO4 VA TUNER BOARD / copper side view

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

Tuner Adjustment table (**ECO4 VA** FM/MW - and FM/MW/LW - versions with AM-ferrite antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
*VARICAP ALIGNMENT * 1)*						
FM			108 MHz	5120	1	8V ± 0.2V
87.5 - 108MHz			87.5MHz	check		4.1V ± 0.5V
FM /14 EAST Europe			108 MHz	5120		8V ± 0.2V
65.81 - 108MHz			65.81 MHz	check		0.8V ± 0.4V
MW 2-band version, 10kHz grid			1710kHz	5123		9V±0.1V (7.2±1.2V) 1)
530 - 1710kHz			530kHz	check		1V±0.4V (1.1±0.5V) 1)
LW			279kHz	5122		8V±0.2V (7.5±1.5V) 1)
153 - 279kHz			153kHz	check		1V±0.4 (1.1±0.5V) 1)
MW 3-band version			1611kHz	5123		8V±0.1V(7.2±1.2V) 1)
522 - 1611kHz			522kHz	check		1V±0.4V (1.1± 0.5V) 1)
FM - RF						
FM	108MHz	A mod= 1kHz Δf=22.5kHz	108MHz	2115	3	MAX ↕
	87.5MHz		87.5MHz	5109		
FM /14 East Europe	108MHz		108MHz	2115		
	65.81MHz		65.81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	A	98MHz	3148	2	152kHz ± 1kHz
AM - IF						
MW	540kHz Δf= 10kHz as low as possible	 100nF 50E C	540kHz	5142 5140	4	symmetrical and max height
AM - RF						
LW	198kHz	B mod= 1kHz 30% AM	198kHz	5122	4	MAX
MW 3-band version	1494kHz		1494kHz	2130		MAX ↕
	549kHz		549kHz	5123		
MW 2-band version, 10kHz grid	1500kHz		1500kHz	2130		
	550kHz		550kHz	5123		

* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ.automatically.

1) Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfils value stated within brackets after AM-RF adjustment.

↕ repeat

ELECTRICAL PARTS - ECO4VA BOARD (For all versions except /22)

MISCELLANEOUS

1101	4822 267 10283	z	Socket Coaxial 75Ω
1104	4822 267 31505	y	Antenna socket 300Ω

2100	4822 122 33195	z	100pF 10% 50V
2104	4822 122 33195		100pF 10% 50V
2107	5322 122 34123		1nF 10% 50V
2110	5322 122 32659	x	33pF 5% 50V
2110	5322 122 32269	o	6,8pF 5% 50V
2112	4822 122 33496		100nF 10% 63V
2114	5322 122 32531	x	100pF 5% 50V
2115	4822 125 60101		Trimmer 3-11pF 100V
2120	5322 122 32268		470pF 10% 50V
2121	5322 122 32481		15pF 5% 50V
2122	5322 122 34123		1nF 10% 50V
2123	5322 122 34123		1nF 10% 50V
2124	4822 121 51387		10nF 20% 16V
2129	4822 121 43705	x	390pF 1% 160V
2130	4822 125 50355		Trimmer 4,2 - 20pF 100V
2133	4822 122 33128	x	15nF 10% 63V
2134	4822 122 33197		1nF 10% 50V
2135	4822 121 70245		560pF 1% 160V
2138	5322 122 32659		33pF 5% 50V
2139	4822 122 33891	x	3,3nF 10% 63V
2141	4822 124 40244		2,2µF 20% 63V
2142	4822 124 40242		1µF 20% 63V
2143	4822 124 40239		0,47µF 20% 63V
2144	4822 124 40239		0,47µF 20% 63V
2145	4822 122 33496	x	100nF 10% 63V
2146	5322 122 33063	x	2,2pF 5% 50V
2147	4822 122 33177		10nF 20% 50V
2150	4822 124 40248		10µF 20% 63V
2151	4822 124 40248		10µF 20% 63V
2154	4822 122 33893		18nF 10% 63V
2154	4822 122 32541	y	27nF 10% 63V
2155	4822 122 33893		18nF 10% 63V
2155	4822 122 32541	y	27nF 10% 63V
2160	4822 124 40242		1µF 20% 63V
2161	4822 124 40242		1µF 20% 63V
2167	4822 122 33496		100nF 10% 63V
2169	5322 122 31863		330pF 5% 50V
2170	4822 126 11714		4,7nF 20%
2171	5322 126 10223		4,7nF 10% 63V
2172	4822 124 41631		1,5µF 50V
2173	4822 124 40433		47µF 20% 25V
2177	4822 126 12882	x	100nF +80-20% 50V
2178	4822 122 33197		1nF 10% 50V
2179	4822 122 33195		100pF 10% 50V
2180	5322 122 31946		27pF 5% 63V
2181	4822 122 32139		12pF 2% 63V
2183	4822 122 33496		100nF 10% 63V
2184	4822 124 41584		100µF 20% 10V
2185	4822 122 33496		100nF 10% 63V
2186	5322 122 34123		1nF 10% 50V

3106	4822 051 20104		100k 5% 0,1W
3107	4822 051 20222	x	2k2 5% 0,1W
3108	4822 051 20104		100k 5% 0,1W
3109	4822 051 20222	x	2k2 5% 0,1W
3112	4822 116 52176		10Ω 5% 0,5W
3116	4822 051 20335	x	3M3 5% 0,1W
3119	4822 116 52224		470Ω 5% 0,5W
3120	4822 116 52289		5k6 5% 0,5W
3121	4822 051 20104		100k 5% 0,1W
3122	4822 051 20471		470Ω 5% 0,1W
3123	4822 051 20223		22k 5% 0,1W
3124	4822 116 52256	x	2k2 5% 0,5W
3125	4822 051 20472	x	4k7 5% 0,1W
3128	4822 117 10833		10k 1% 0,1W
3129	4822 051 20472	x	4k7 5% 0,1W
3132	4822 116 52283		4k7 5% 0,5W
3141	4822 116 52215		220Ω 5% 0,5W
3142	4822 051 20222		2k2 5% 0,1W
3144	4822 117 10833		10k 1% 0,1W
3147	4822 051 20184		180k 5% 0,1W
3148	4822 100 11163		Trimmer 100k 30% 0,1W
3149	4822 051 20563		56k 5% 0,1W
3151	4822 116 52243		1k5 5% 0,5W
3153	4822 051 20683		68k 5% 0,1W
3156	4822 116 83864		10k 5% 0,5W
3157	4822 051 20273		27k 5% 0,1W
3158	4822 051 20189	x	18Ω 5% 0,1W
3159	4822 051 20563		56k 5% 0,1W
3162	4822 050 11002		1k 1% 0,4W
3163	4822 050 11002		1k 1% 0,4W
3167	4822 051 20008		Jumper 0Ω 0805
3170	4822 116 52283		4k7 5% 0,5W
3171	4822 051 20101		100Ω 5% 0,1W
3172	4822 051 20472		4k7 5% 0,1W
3173	4822 116 52244		15k 5% 0,5W
3174	4822 116 83864		10k 5% 0,5W
3175	4822 051 20104		100k 5% 0,1W
3176	4822 051 20101		100Ω 5% 0,1W
3177	4822 116 83864	x	10k 5% 0,5W
3183	4822 051 20223		22k 5% 0,1W
3184	4822 051 20223		22k 5% 0,1W
3186	4822 051 20104		100k 5% 0,1W
3188	4822 051 10102		1k 2% 0,25W
3189	4822 116 52249		1k8 5% 0,5W
3190	4822 116 52249		1k8 5% 0,5W
3191	4822 116 52249		1k8 5% 0,5W

3192	4822 116 52249		1k8 5% 0,5W
3193	4822 116 52256		2k2 5% 0,5W
3194	4822 116 52219		330Ω 5% 0,5W
3195	4822 116 52219		330Ω 5% 0,5W
3197	4822 116 52219		330Ω 5% 0,5W
3206	4822 116 52215		220Ω 5% 0,5W for /01/19 only
3210	4822 051 20008		Jumper 0Ω 0805
3211	4822 051 10008		0Ω 5% 0,25W
3212	4822 051 10008		0Ω 5% 0,25W
3213	4822 051 10008		0Ω 5% 0,25W
3222	4822 051 20008	o	Jumper 0Ω 0805
3223	4822 051 20008	x	Jumper 0Ω 0805
3224	4822 051 20008		Jumper 0Ω 0805
3226	4822 051 20008	o	Jumper 0Ω 0805
3228	4822 051 10008		0Ω 5% 0,25W
3229	4822 051 20008	o	Jumper 0Ω 0805
3231	4822 051 20008		Jumper 0Ω 0805
3233	4822 051 20008		Jumper 0Ω 0805
3235	4822 051 20008		Jumper 0Ω 0805
3237	4822 051 10008		0Ω 5% 0,25W
3238	4822 051 20008	x	Jumper 0Ω 0805
3240	4822 051 10479		47Ω 2% 0,25W
3241	4822 051 20008	o	Jumper 0Ω 0805
3242	4822 051 10008		0Ω 5% 0,25W
3243	4822 051 20008	o	Jumper 0Ω 0805
3244	4822 051 20008		Jumper 0Ω 0805
3245	4822 051 20008	o	Jumper 0Ω 0805
3246	4822 051 10008		0Ω 5% 0,25W
3247	4822 051 10008		0Ω 5% 0,25W
3248	4822 051 10008		0Ω 5% 0,25W

5105	4822 158 60641	x	MW/LW Ferrite Antenna
5106	4822 158 60642	o	MW Ferrite Antenna
5109	4822 156 30947		RF Coil 1,5 T
5120	4822 156 30947		RF Coil 1,5 T
5122	4822 157 60517	x	LW Osc. Coil
5123	4822 157 60517		MW Osc. Coil
5125	4822 157 61898		Coil 0,47µH 20% for /01/19 only
5140	4822 158 60511		AM-IF Filter 450kHz
5142	4822 157 70302		AM-IF Filter 450kHz
5143	4822 242 70665		Ceram Filter 10,7MHz
5144	4822 242 70665		Ceram Filter 10,7MHz
5145	4822 242 81362		Ceram Discriminator
5170	4822 242 72976		X'tal Resonator 7,2MHz

6105	4822 130 83075		HN1V02H
6109	4822 130 82833		1SV228
6121	4822 130 30621		1N4148 See schematics
6122	4822 130 30621		1N4148 See schematics
6123	4822 130 30621		1N4148 See schematics
6124	4822 130 82833		1SV228
6140	4822 130 30621		1N4148
6154	4822 130 30621		1N4148
6170	4822 130 30621		1N4148
6174	4822 130 34233		BZX79-B5V1

7102	5322 130 42136	x	BC848C
7104	5322 130 42136	x	BC848C
7105	4822 130 60093		2SA838B
7120	4822 130 60163		2SC1047
7121	5322 130 42136	x	BC848C
7123	5322 130 42136	x	BC848C
7128	5322 130 42136	x	BC848C
7140	4822 209 32701		TEA5712T/N2
7168	5322 130 41983		BC858B
7170	5322 130 42136		BC848C
7171	5322 130 42136		BC848C
7172	5322 209 11517		PC74HCU04T Inverter
7173	4822 209 31998		LC7218M Synthesizer
7179	5322 130 42136	x	BC848C

o For 2-band version only
x For LW version only
y For USA version only
z Not for all versions

Note:Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PA

MISC

1101	4822
1110	4822

2101	5322
2102	5322
2103	4822
2104	4822
2105	5322
2108	5322
2109	5322
2110	5322
2111	4822
2112	5322
2113	5322
2114	5322
2115	4822
2116	5322
2117	4822
2118	4822
2119	4822
2120	4822
2121	4822
2123	4822
2124	4822
2125	4822
2127	5322
2128	5322
2129	4822
2131	4822
2132	5322
2133	5322
2135	4822
2142	4822
2144	4822
2145	4822
2146	4822
2147	5322
2148	5322
2149	4822
2150	5322
2151	4822
2152	4822
2153	5322
2154	5322
2155	5322
2156	4822
2158	5322
2159	5322
2160	4822
2161	4822

3192	4822 116 52249		1k8 5% 0,5W
3193	4822 116 52256		2k2 5% 0,5W
3194	4822 116 52219		330Ω 5% 0,5W
3195	4822 116 52219		330Ω 5% 0,5W
3197	4822 116 52219		330Ω 5% 0,5W
3206	4822 116 52215		220Ω 5% 0,5W for /01/19 only
3210	4822 051 20008		Jumper 0Ω 0805
3211	4822 051 10008		0Ω 5% 0,25W
3212	4822 051 10008		0Ω 5% 0,25W
3213	4822 051 10008		0Ω 5% 0,25W
3222	4822 051 20008	o	Jumper 0Ω 0805
3223	4822 051 20008	x	Jumper 0Ω 0805
3224	4822 051 20008		Jumper 0Ω 0805
3226	4822 051 20008	o	Jumper 0Ω 0805
3228	4822 051 10008		0Ω 5% 0,25W
3229	4822 051 20008	o	Jumper 0Ω 0805
3231	4822 051 20008		Jumper 0Ω 0805
3233	4822 051 20008		Jumper 0Ω 0805
3235	4822 051 20008		Jumper 0Ω 0805
3237	4822 051 10008		0Ω 5% 0,25W
3238	4822 051 20008	x	Jumper 0Ω 0805
3240	4822 051 10479		47Ω 2% 0,25W
3241	4822 051 20008	o	Jumper 0Ω 0805
3242	4822 051 10008		0Ω 5% 0,25W
3243	4822 051 20008	o	Jumper 0Ω 0805
3244	4822 051 20008		Jumper 0Ω 0805
3245	4822 051 20008	o	Jumper 0Ω 0805
3246	4822 051 10008		0Ω 5% 0,25W
3247	4822 051 10008		0Ω 5% 0,25W
3248	4822 051 10008		0Ω 5% 0,25W

5105	4822 158 60641	x	MW/LW Ferrite Antenna
5106	4822 158 60642	o	MW Ferrite Antenna
5109	4822 156 30947		RF Coil 1,5 T
5120	4822 156 30947		RF Coil 1,5 T
5122	4822 157 60517	x	LW Osc. Coil
5123	4822 157 60517		MW Osc. Coil
5125	4822 157 61898		Coil 0,47µH 20% for /01/19 only
5140	4822 158 60511		AM-IF Filter 450kHz
5142	4822 157 70302		AM-IF Filter 450kHz
5143	4822 242 70665		Ceram Filter 10,7MHz
5144	4822 242 70665		Ceram Filter 10,7MHz
5145	4822 242 81362		Ceram Discriminator
5170	4822 242 72976		X'tal Resonator 7,2MHz

6105	4822 130 83075	HN1V02H
6109	4822 130 82833	1SV228
6121	4822 130 30621	1N4148 See schematics
6122	4822 130 30621	1N4148 See schematics
6123	4822 130 30621	1N4148 See schematics
6124	4822 130 82833	1SV228
6140	4822 130 30621	1N4148
6154	4822 130 30621	1N4148
6170	4822 130 30621	1N4148
6174	4822 130 34233	BZX79-B5V1

7102	5322 130 42136	x	BC848C
7104	5322 130 42136	x	BC848C
7105	4822 130 60093		2SA838B
7120	4822 130 60163		2SC1047
7121	5322 130 42136	x	BC848C
7123	5322 130 42136	x	BC848C
7128	5322 130 42136	x	BC848C
7140	4822 209 32701		TEA5712T/N2
7168	5322 130 41983		BC858B
7170	5322 130 42136		BC848C
7171	5322 130 42136		BC848C
7172	5322 209 11517		PC74HCU04T Inverter
7173	4822 209 31998		LC7218M Synthesizer
7179	5322 130 42136	x	BC848C

o For 2-band version only
x For LW version only
y For USA version only
z Not for all versions

Note:Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS - TUNER 92VA BOARD (For /22 only)

MISCELLANEOUS

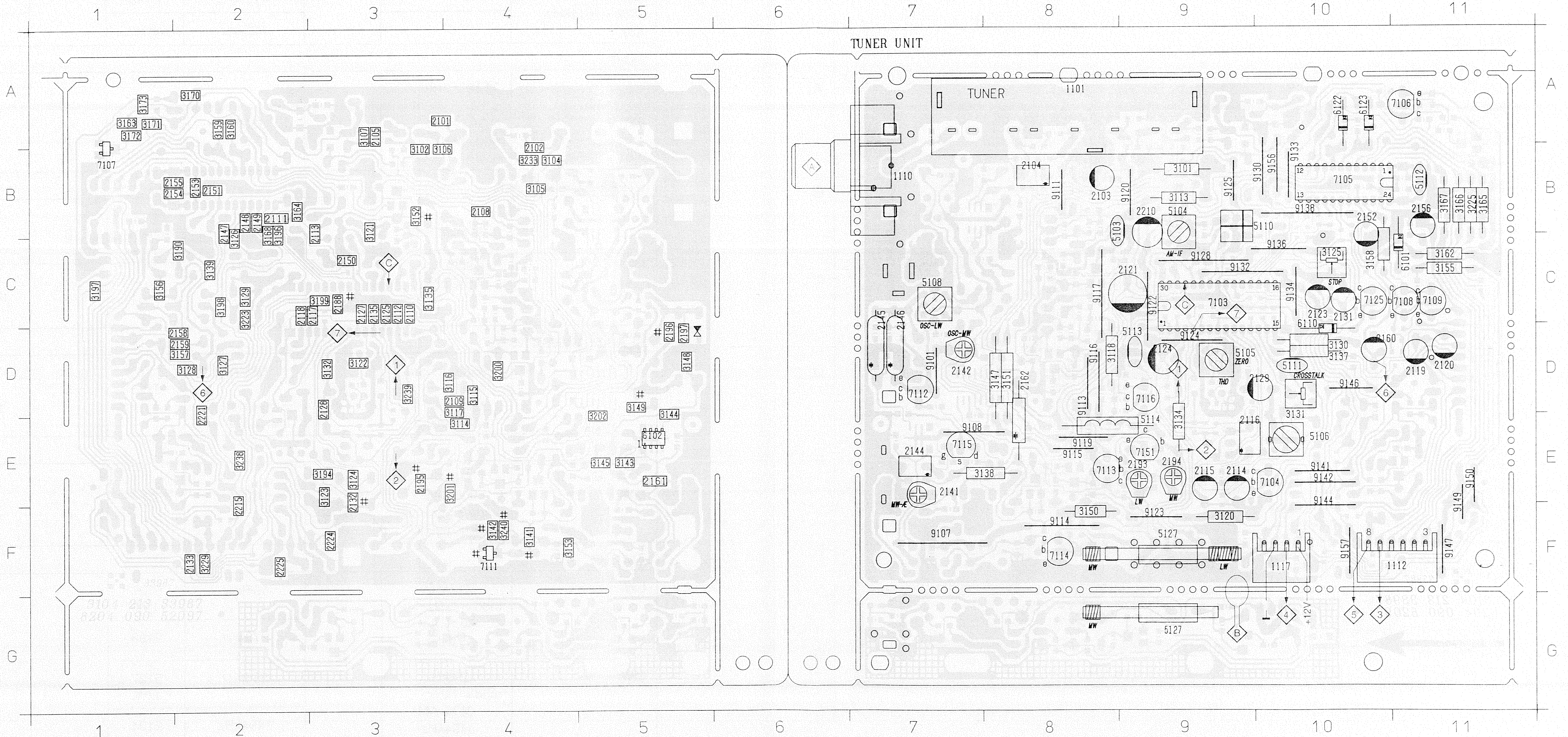
1101	4822 210 10492	Tuner FE415-G11
1110	4822 267 10283	FM Antenna socket

2101	5322 122 34099	470pF 10% 63V
2102	5322 122 32268	470pF 10% 50V
2103	4822 124 40433	47µF 20% 25V
2104	4822 121 42408	220nF 5% 63V
2105	5322 122 32654	22nF 10% 63V
2108	5322 122 32654	22nF 10% 63V
2109	5322 122 32654	22nF 10% 63V
2110	5322 122 32654	22nF 10% 63V
2111	4822 122 32927	220nF +80-20% 50V
2112	5322 122 32654	22nF 10% 63V
2113	5322 122 32661	56pF 5% 50V
2114	5322 124 41431	22µF 20% 35V
2115	4822 124 40239	0,47µF 20% 63V
2116	5322 121 42386	100nF 5% 63V
2117	4822 122 33336	8,2nF 10% 50V
2118	4822 122 33336	8,2nF 10% 50V
2119	4822 124 40244	2,2µF 20% 63V
2120	4822 124 40244	2,2µF 20% 63V
2121	4822 124 40196	220µF 20% 16V
2123	4822 124 40246	4,7µF 20% 63V
2124	4822 124 40246	4,7µF 20% 63V
2125	4822 122 33177	10nF 20% 50V
2127	5322 122 31863	330pF 5% 50V
2128	5322 116 80853	560pF 5% 63V
2129	4822 124 40242	1µF 20% 63V
2131	4822 124 40248	10µF 20% 63V
2132	5322 122 32268	470pF 10% 50V
2133	5322 126 10794	220pF 5% 63V
2135	4822 122 33128	15nF 10% 63V
2142	4822 125 60102	Trimmer 5,2-30pF 100V
2144	4822 121 42408	220nF 5% 63V
2145	4822 121 51263	510pF 1% 400V
2146	4822 121 70082	430pF 1% 400V
2147	5322 122 32654	22nF 10% 63V
2148	5322 122 32452	47pF 5% 63V
2149	4822 122 33177	10nF 20% 50V
2150	5322 122 32654	22nF 10% 63V
2151	4822 122 33219	1,8nF 10% 50V
2152	4822 124 40242	1µF 20% 63V
2153	5322 122 34099	470pF 10% 63V
2154	5322 122 32481	15pF 5% 50V
2155	5322 122 32965	18pF 5% 50V
2156	4822 124 40433	47µF 20% 25V
2158	5322 126 10223	4,7nF 10% 63V
2159	5322 126 10223	4,7nF 10% 63V
2160	4822 124 41631	1,5µF 20% 50V
2161	4822 122 32927	220nF +80-20% 50V
2162	4822 126 11585	22nF +80-20% 25V
2188	5322 122 32654	22nF 10% 63V
2193	4822 125 60102	Trimmer 5,2-30pF 100V
2194	4822 125 60101	Trimmer 3-11pF 100V
2195	5322 122 33861	120pF 10% 50V
2196	5322 122 32448	10pF 5% 50V
2210	4822 124 41643	100µF 20% 16V
2215	5322 122 32268	470pF 10% 50V
2221	5322 122 32268	470pF 10% 50V
2224	4822 122 33575	220pF 5% 50V
2225	4822 122 33575	220pF 5% 50V

3101	4822 052 10478	△	4Ω7 5% 0,33W
3102	4822 051 20224		220k 5% 0,1W
3104	4822 051 20154		150k 5% 0,1W
3105	4822 051 20562		5k6 5% 0,1W
3106	4822 051 20829		82Ω 5% 0,1W
3107	4822 051 20008		0Ω Jumper 0805
3113	4822 050 22201	△	220Ω 1% 0,6W
3114	4822 051 20332		3k3 5% 0,1W
3115	4822 051 20391		390Ω 5% 0,1W
3116	4822 051 20478		4Ω7 5% 0,1W
3117	4822 051 20331		330Ω 5% 0,1W
3118	4822 050 22201	△	220Ω 1% 0,6W
3120	4822 052 10229	△	22Ω 5% 0,33W
3121	4822 051 20272		2k7 5% 0,1W
3122	4822 051 20562		5k6 5% 0,1W
3123	4822 051 20223		22k 5% 0,1W
3124	4822 117 10833		10k 1% 0,1W
3125	4822 100 11213		Trimmer 22k 30% 0,1W
3126	4822 051 20123		12k 5% 0,1W
3127	4822 051 20182		1k8 5% 0,1W
3128	4822 051 20182		1k8 5% 0,1W
3129	4822 051 20822		8k2 5% 0,1W
3130	4822 116 52283		4k7 5% 0,5W
3131	4822 100 11319		Trimmer 4k7 30% 0,1W
3132	4822 117 10833		10k 1% 0,1W
3134	4822 116 52289		5k6 5% 0,5W
3135	4822 051 10008		0Ω 5% 0,25W
3137	4822 116 52283		4k7 5% 0,5W
3138	4822 116 83922	△	150Ω 5% 1W
3139	4822 051 20008		0Ω Jumper 0805
3141	4822 051 20472		4k7 5% 0,1W
3142	4822 051 20472		4k7 5% 0,1W
3143	4822 051 20821		820Ω 5% 0,1W
3144	4822 051 20331		330Ω 5% 0,1W
3145	4822 051 20271		270Ω 5% 0,1W
3147	4822 116 52289		5k6 5% 0,5W
3148	4822 051 20104		100k 5% 0,1W
3149	4822 051 20472		4k7 5% 0,1W

TUNER 92 LAYOUT

1101	A8	2115	E9	2135	C3	2158	D2	3101	B9	3124	E3	3143	E5	3162	C11	3199	C3	5110	B10	7108	C11	9115	E8	9141	E10
1110	B7	2116	E9	2141	E7	2159	D2	3102	B3	3125	C10	3144	E5	3163	A1	3200	D4	5111	D10	7109	C11	9116	D8	9142	E10
1112	F11	2117	C3	2142	D7	2160	D10	3104	B4	3126	C2	3145	E5	3164	B2	3201	E4	5112	B11	7111	F4	9117	C8	9144	F10
1117	F10	2118	C2	2144	E7	2161	E5	3105	B4	3127	D2	3147	D8	3165	B11	3202	E5	5113	D9	7112	D7	9119	E8	9146	D10
2101	A3	2119	D11	2145	C7	2162	D8	3106	B4	3128	D2	3148	D5	3166	B11	3223	C2	5114	E9	7113	E8	9120	B9	9147	F11
2102	B4	2120	D11	2146	C7	2188	C3	3107	A3	3129	C2	3149	D5	3167	B11	3225	B11	5127	F9	7114	F8	9122	C9	9149	E11
2103	B8	2121	C9	2147	B2	2193	E9	3113	B9	3130	D10	3150	F8	3168	B2	3229	F2	6101	C11	7115	E7	9123	F9	9150	E11
2104	B8	2123	C10	2148	B2	2194	E9	3114	E4	3131	E10	3151	D8	3170	A2	3233	B4	6102	E5	7116	D9	9124	D9	9156	B10
2105	A3	2124	D9	2149	B2	2195	E3	3115	D4	3132	D3	3152	B3	3171	A1	3238	E2	6110	D10	7125	C10	9125	B9	9157	F10
2108	B4	2125	C3	2150	C3	2196	D5	3116	D4	3134	E9	3153	F5	3172	A1	3239	D3	6122	A10	7151	E9	9128	C9		
2109	D4	2127	C3	2151	B2	2197	D5	3117	E4	3135	C3	3155	C11	3173	A1	3240	F4	6123	A10	9101	D7	9130	B10		
2110	C3	2128	D3	2152	B10	2210	B9	3118	D8	3137	D10	3156	C1	3190	C2	5103	B9	7103	C9	9107	F7	9132	C9		
2111	B2	2129	D10	2153	B2	2215	E2	3120	F9	3138	E8	3157	D2	3194	E3	5104	B9	7104	E10	9108	E7	9133	B10		
2112	C3	2131	C10	2154	B2	2221	D2	3121	B3	3139	C2	3158	C10	3196	B2	5105	D9	7105	B10	9111	B8	9134	C10		
2113	B3	2132	F3	2155	B2	2224	F3	3122	D3	3141	F4	3159	A2	3197	C1	5106	E10	7106	A11	9113	D8	9136	C10		
2114	E9	2133	F2	2156	B11	2225	F2	3123	E3	3142	F4	3160	A2	3198	C2	5108	C7	7107	B1	9114	F8	9138	B10		



# NOT FOR JAPAN
⧗ ONLY FOR JAPAN

3104-217-03800 .7

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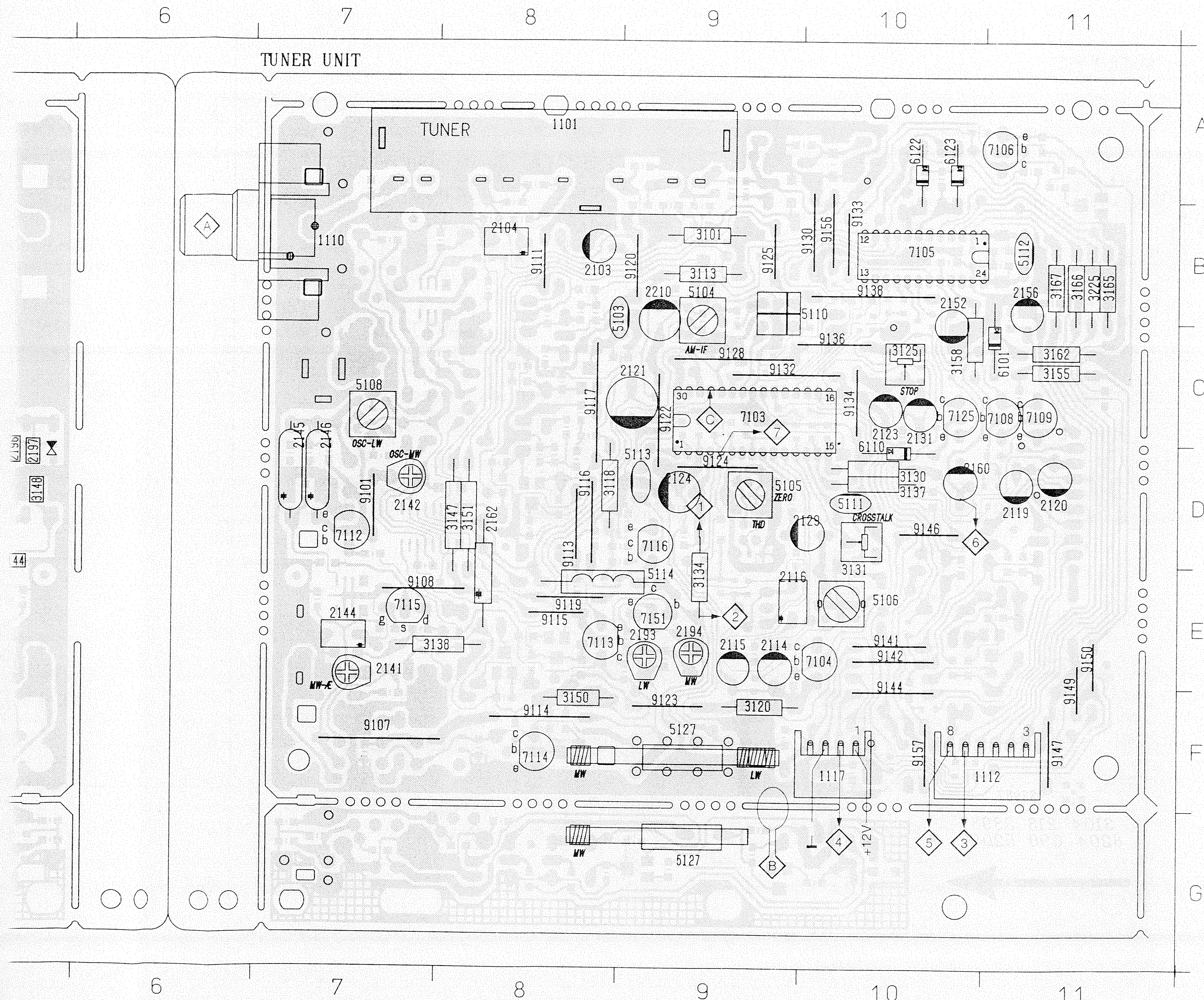
11	9116	D8	9142	E10
4	9117	C8	9144	F10
7	9119	E8	9146	D10
8	9120	B9	9147	F11
8	9122	C9	9149	E11
7	9123	F9	9150	E11
9	9124	D9	9156	B10
10	9125	B9	9157	F10
9	9128	C9		
7	9130	B10		
7	9132	C9		
7	9133	B10		
8	9134	C10		
8	9136	C10		
8	9138	B10		


6
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TUNER UNIT
TUNER
1101
1110
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2104
9111
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3101
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5112
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2152
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3225
3165
9136
3125
3158
6101
3162
3155
AM-IF
9128
9132
2121
9117
9122
7103
9134
STOP
7125
7108
7109
2123
2131
6110
3130
3137
2160
2119
2120
5113
9124
5105
ZERO
5111
THD
CROSSTALK
2129
9146
3131
5108
OSC-LW
OSC-MW
2145
2146
9101
2142
3147
3151
2162
9116
3118
7112
7116
9113
5114
3134
2116
5106
9108
7115
2144
9119
9115
7151
7113
2193
2194
2115
2114
7104
9141
9142
9144
3138
2141
MW-E
3150
9114
9123
3120
LW
MW
9107
5127
7114
1117
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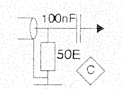
9149
9150
9147
6122
6123
7106
+12V
2197
3148
44

04-217-03800 .7

TUNER Adjustment Table (FM,MW,LW with Ferroceptor)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50)			108 MHz	check	6	7.....9V
			87.5MHz	check		1.3.....2V
LW 153 - 279kHz (3)			279kHz	5108		8.5V ± 0.1V
			153kHz	check		0.7.... 1.5V
MW 522 - 1611kHz (9)			1611kHz	2142		8,5V ± 0.1V
			522kHz	check		0.7.....1.7V
FM IF						
FM	98 MHz 1mV mod = 1kHz Δf = 75kHz	A	98MHz	5105	1 2	0V ± 20mV
STEREO CROSSTALK						
FM	98 MHz 1mV 90% L + 9% pilot	A	98MHz	check	3	low < 1V
				3131	4	Right channel min.
SEARCH SENSITIVITY						
FM	98 MHz 12μV mod = 1kHz Δf = 75kHz	A	98MHz Sensitivity low "Level"	3125	5	Switches just from High to Low
AM - IF						
MW	1494kHz Δf = 10kHz low as posible swept signal	 100nF 50E C	1494kHz	5104	7	symmetrical and max height
AM - RF						
LW	155kHz mod = 1kHz 30 % AM	B *	155kHz	5127 LW	7	▲ MAX
	270kHz		270kHz	2193		▼
MW	558kHz mod = 1kHz 30 % AM		558kHz	5127 MW		▲ MAX
	1494kHz		1494kHz	2194		▼

* Signal send via a frame antenna
(..) = tuning grid in kHz

▲
repeat
▼

3150	4822 050 25601		560Ω 1% 0,6W
3151	4822 116 52283		4k7 5% 0,5W
3152	4822 117 10833		10k 1% 0,1W
3153	4822 051 20274		270k 5% 0,1W
3155	4822 050 22201	△	220Ω 1% 0,6W
3156	4822 051 20153		15k 5% 0,1W
3157	4822 051 20472		4k7 5% 0,1W
3158	4822 116 52283		4k7 5% 0,5W
3159	4822 051 20104		100k 5% 0,1W
3160	4822 051 20104		100k 5% 0,1W
3162	4822 050 22701	△	270Ω 1% 0,6W
3163	4822 117 10833		10k 1% 0,1W
3164	4822 051 20473		47k 5% 0,1W
3165	4822 050 11002		1k 1% 0,4W
3166	4822 050 11002		1k 1% 0,4W
3167	4822 050 11002		1k 1% 0,4W
3168	4822 051 20008		0Ω Jumper 0805
3170	4822 117 10833		10k 1% 0,1W
3171	4822 051 20223		22k 5% 0,1W
3172	4822 051 20472		4k7 5% 0,1W
3173	4822 051 20223		22k 5% 0,1W
3190	4822 051 20479		47Ω 5% 0,1W
3194	4822 051 20472		4k7 5% 0,1W
3196	4822 051 20008		0Ω Jumper 0805
3197	4822 051 20008		0Ω Jumper 0805
3198	4822 117 10833		10k 1% 0,1W
3199	4822 051 20471		470Ω 5% 0,1W
3200	4822 051 20008		0Ω Jumper 0805
3201	4822 051 20472		4k7 5% 0,1W
3202	4822 051 20008		0Ω Jumper 0805
3223	4822 051 20474		470k 5% 0,1W
3225	4822 050 11002		1k 1% 0,4W
3229	4822 051 20008		0Ω Jumper 0805
3233	4822 051 10102		1k 2% 0,25W
3238	4822 051 20008		0Ω Jumper 0805
3239	4822 051 20274		270k 5% 0,1W
3240	4822 051 20472		4k7 5% 0,1W

5103	4822 242 72342	Ceram Filter 10,7MHz
5104	4822 157 63029	AM IF Coil
5105	4822 157 63904	Q Detection Coil
5106	4822 157 71661	Birdy Coil
5108	4822 157 63912	AM Osc. Coil
5110	4822 242 71878	Ceram Filter 450kHz
5111	4822 242 81248	Ceram Resonator 19kHz
5112	4822 242 72976	X'tal Resonator 7,2MHz
5113	4822 242 72342	Ceram Filter 10,7MHz
5114	4822 157 51503	Coil 560µH 10%
5127	4822 158 60643	Ferroceptor

6101	4822 130 34174	BZX79-C4V7
6102	4822 130 83075	HN1V02H
6110	4822 130 30621	1N4148

7103	4822 209 31001	LA1851N
7104	5322 130 60068	BC558C
7105	4822 209 30178	LC7218
7106	4822 130 41327	BC327-40
7107	5322 130 41982	BC848B
7108	4822 130 44196	BC548C
7109	4822 130 44196	BC548C
7111	5322 130 41982	BC848B
7112	4822 130 60163	2SC1047
7113	4822 130 44196	BC548C
7114	4822 130 40937	BC548B
7115	4822 130 41024	BF245B
7116	4822 130 60163	2SC1047
7125	4822 130 44197	BC558B
7151	4822 130 60163	2SC1047

Note:Only the parts mentioned in this list are normal service spare parts.

Service
Service
Service

Product Service Group CE Audio

Service Information

Already published informations: A94-153 (4822 725 25133)
A94-155 (4822 725 25138)
A94-158 (4822 725 25143)

(GB)

To adapt the service manual the following sheets have been added/changed.

(NL)

Voor het aanpassen van de service manual zijn de onderstaande pagina's toegevoegd/gewijzigd.

(F)

Afin de pouvoir adapter le "manual service" les feuillets suivants ont été soit modifiés, soit ajoutés.

(D)

Zür anpassung des Service Manual sind die nachstehenden Seiten hinzugefügt/geändert.

(I)

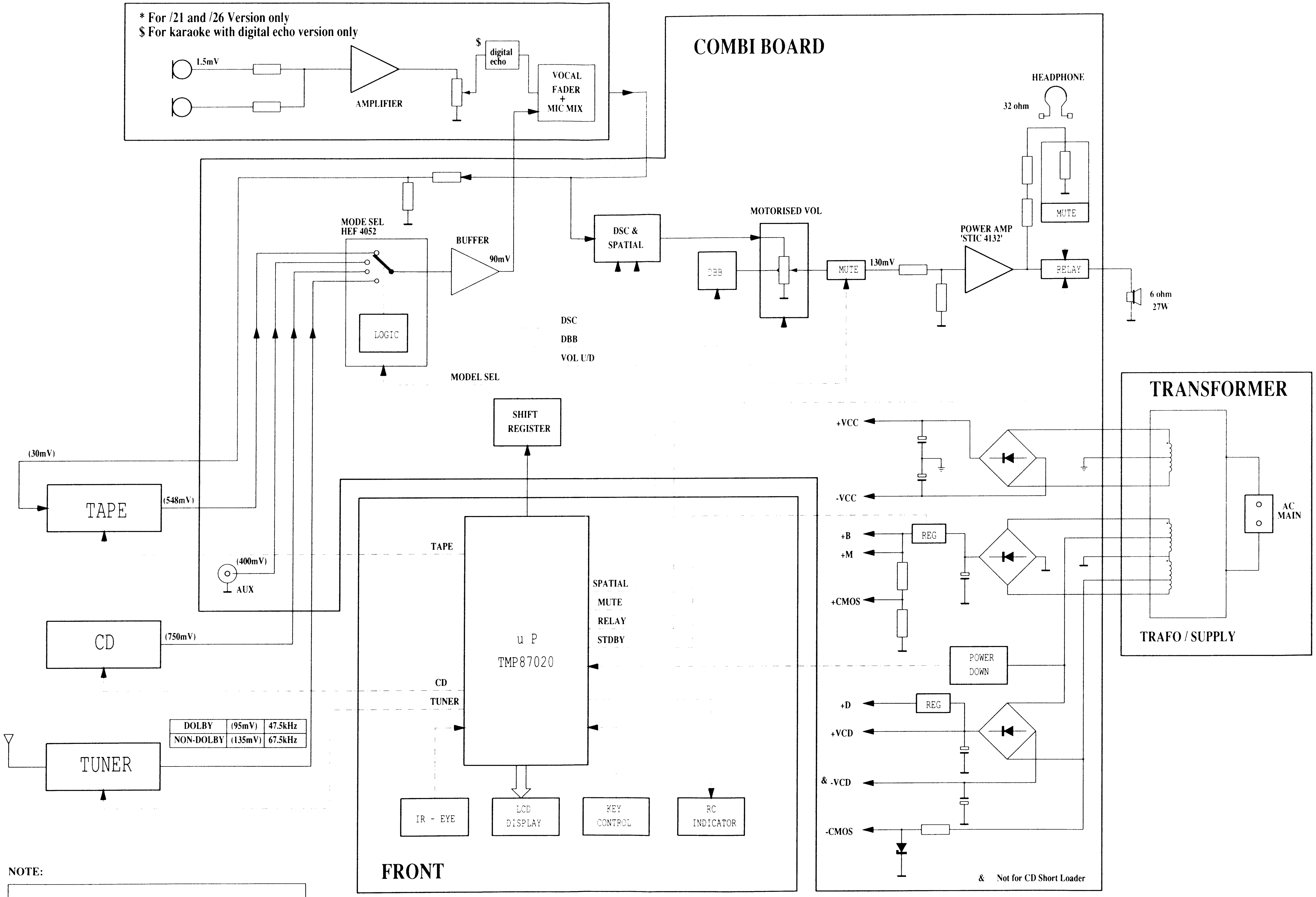
Le seguenti pagine sono state cambiate/aggiunte allo scopo di adattare il Manuale di Servizio.

Introduction of **FW46/41M** version with new Karaoke board with digital echo (see enclosed drawings). The existing Karaoke board on the Combi board will not be used.

Mains voltage: Switchable 110-127V / 220-240V

Page No.	**PCS Number**	**Reason**
Block diagram	PCS 64 364	Update for /41M
Wiring diagram	PCS 64 365	Update for /41M
Karaoke board	PCS 64 366	New drawings for /41M
Parts list	PCS 64 367	For New Karaoke board

BLOCK DIAGRAM


* For /21 and /26 Version only
$ For karaoke with digital echo version only
1.5mV
AMPLIFIER
$
digital echo
VOCAL FADER + MIC MIX
COMBI BOARD
HEADPHONE
32 ohm
MUTE
MODE SEL HEF 4052
BUFFER
90mV
DSC & SPATIAL
MOTORISED VOL
DBB
MUTE
130mV
POWER AMP 'STIC 4132'
RELAY
6 ohm 27W
LOGIC
DSC
DBB
VOL U/D
MODEL SEL
SHIFT REGISTER
TRANSFORMER
+VCC
-VCC
+B
+M
REG
+CMOS
POWER DOWN
AC MAIN
TRAFO / SUPPLY
(30mV)
TAPE
(548mV)
(400mV)
AUX
CD
(750mV)
DOLBY | (95mV) | 47.5kHz
NON-DOLBY | (135mV) | 67.5kHz
TUNER
TAPE
SPATIAL
MUTE
RELAY
STDBY
u P TMP87020
CD
TUNER
IR - EYE
LCD DISPLAY
KEY CONTROL
RC INDICATOR
FRONT
+D
REG
+VCD
& -VCD
-CMOS
& Not for CD Short Loader

NOTE:

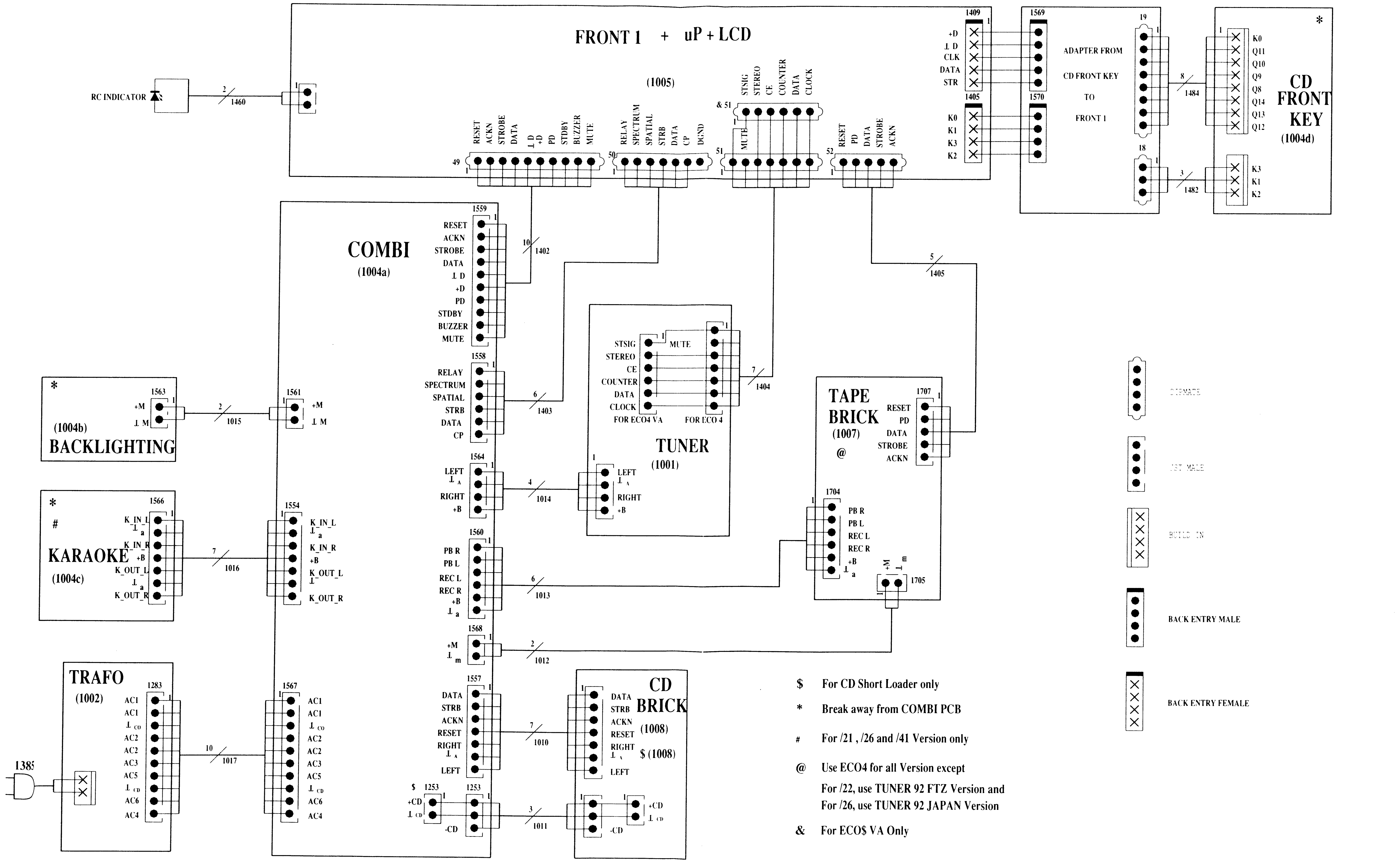
TUNER MODULE

ECO4 for all Version except

For /22, use TUNER 92 with FTZ Version and

For /26, use TUNER 92 JAPAN Version.

WIRING DIAGRAM



FRONT 1 + uP + LCD
(1005)
RC INDICATOR
1460
1409
+D
⊥ D
CLK
DATA
STR
1405
K0
K1
K3
K2
1569
1570
ADAPTER FROM
CD FRONT KEY
TO
FRONT 1
19
18
1484
1482
K0
Q11
Q10
Q9
Q8
Q14
Q13
Q12
K3
K1
K2
CD FRONT KEY
(1004d)
49
RESET
ACKN
STROBE
DATA
⊥ D
+D
PD
STDBY
BUZZER
MUTE
50
RELAY
SPECTRUM
SPATIAL
STRB
DATA
CP
DGND
& 51
STSIG
STEREO
CE
COUNTER
DATA
CLOCK
51
MUTE
52
RESET
PD
DATA
STROBE
ACKN
COMBI
(1004a)
1559
1402
1558
1403
1564
1014
1560
1013
1568
1012
1557
1010
1253
1011
-CD
+CD
⊥ CD
1561
1554
1567
1563
1015
(1004b)
BACKLIGHTING
+M
⊥ M
1566
#
KARAOKE
(1004c)
K_IN_L
K_IN_R
K_OUT_L
K_OUT_R
+B
1016
TRAFO
(1002)
1283
AC1
⊥ CD
AC2
AC3
AC5
AC6
AC4
1017
1385
TUNER
(1001)
FOR ECO4 VA
FOR ECO 4
1404
LEFT
RIGHT
TAPE BRICK
(1007)
@
1707
1405
1704
PB R
PB L
REC L
REC R
1705
CD BRICK
(1008)
$ (1008)
STRB
DIPMATE
1ST MALE
BUILD IN
BACK ENTRY MALE
BACK ENTRY FEMALE

$ For CD Short Loader only

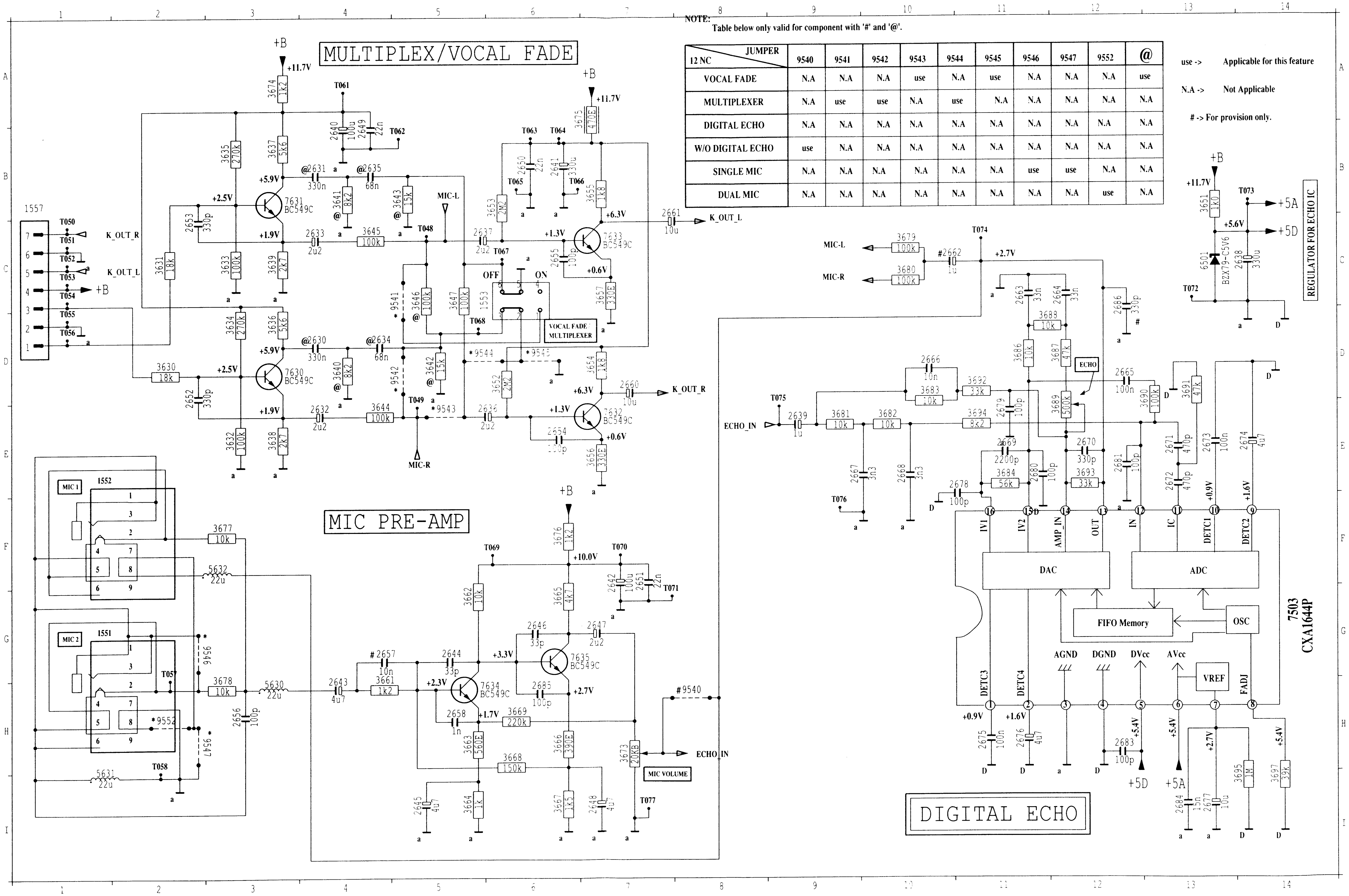
* Break away from COMBI PCB

# For /21 , /26 and /41 Version only

@ Use ECO4 for all Version except
For /22, use TUNER 92 FTZ Version and
For /26, use TUNER 92 JAPAN Version

& For ECO$ VA Only

KARAOKE (WITH DIGITAL ECHO) SCHEMATIC & LAYOUT


MULTIPLEX/VOCAL FADE
MIC PRE-AMP
DIGITAL ECHO
REGULATOR FOR ECHO IC
7503
CXA1644P
DAC
ADC
FIFO Memory
OSC
VREF
VOCAL FADE MULTIPLEXER
MIC VOLUME
MIC 1
MIC 2
ECHO
K_OUT_R
K_OUT_L
MIC-L
MIC-R
ECHO_IN
+B
+11.7V
+5A
+5D
7630 BC549C
7631 BC549C
7632 BC549C
7633 BC549C
7634 BC549C
7635 BC549C
BZX79-C5V6
IV1
IV2
AMP_IN
OUT
IN
IC
DETC1
DETC2
DETC3
DETC4
AGND
DGND
DVcc
AVcc
FADJ
1557
1551
1552
1553

NOTE:
Table below only valid for component with '#' and '@'.

12 NC \ JUMPER	9540	9541	9542	9543	9544	9545	9546	9547	9552	@
VOCAL FADE	N.A	N.A	N.A	use	N.A	use	N.A	N.A	N.A	use
MULTIPLEXER	N.A	use	use	N.A	use	N.A	N.A	N.A	N.A	N.A
DIGITAL ECHO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
W/O DIGITAL ECHO	use	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
SINGLE MIC	N.A	N.A	N.A	N.A	N.A	N.A	use	use	N.A	N.A
DUAL MIC	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	use	N.A

use -> Applicable for this feature

N.A -> Not Applicable

-> For provision only.

1551	G	1
1552	E	1
1553	C	6
1557	B	1
2630	D	4
2631	B	4
2632	E	4
2633	C	4
2634	D	4
2635	B	4
2636	E	6
2637	C	5
2638	C	14
2639	E	9
2640	B	4
2641	B	6
2642	F	7
2643	H	4
2644	G	5
2645	I	5
2646	G	6
2647	G	7
2648	I	7
2649	B	4
2650	B	6
2651	F	7
2652	D	2
2653	C	2
2654	E	6
2655	C	6
2656	H	3
2657	G	4
2658	H	5
2660	D	7
2661	B	7
2662	C	10
2663	C	11
2664	C	12
2665	D	12
2666	D	10
2667	E	9
2668	E	10
2669	E	11
2670	E	12
2671	E	13
2672	E	13
2673	E	13
2674	E	14
2675	H	11
2676	H	11
2677	I	13
2678	E	11
2679	E	11
2680	E	11
2681	E	12
2683	H	12
2684	I	13
2685	H	6
2686	C	12
3630	D	2
3631	C	2
3632	E	3
3633	C	3
3634	D	3
3635	B	3
3636	D	3
3637	B	3
3638	E	3
3639	C	3
3640	D	4
3641	B	4
3642	D	5
3643	B	5
3644	E	4
3645	C	4
3646	C	5
3647	C	5
3651	B	13
3652	D	6
3653	B	6
3654	D	7
3655	B	7
3656	E	7
3657	C	7
3661	H	4
3662	G	5
3663	H	5
3664	I	5
3665	G	6
3666	H	6
3667	I	6
3668	H	6
3669	H	6
3673	H	7
3674	A	5
3675	A	7
3676	F	6
3677	F	3
3678	H	3

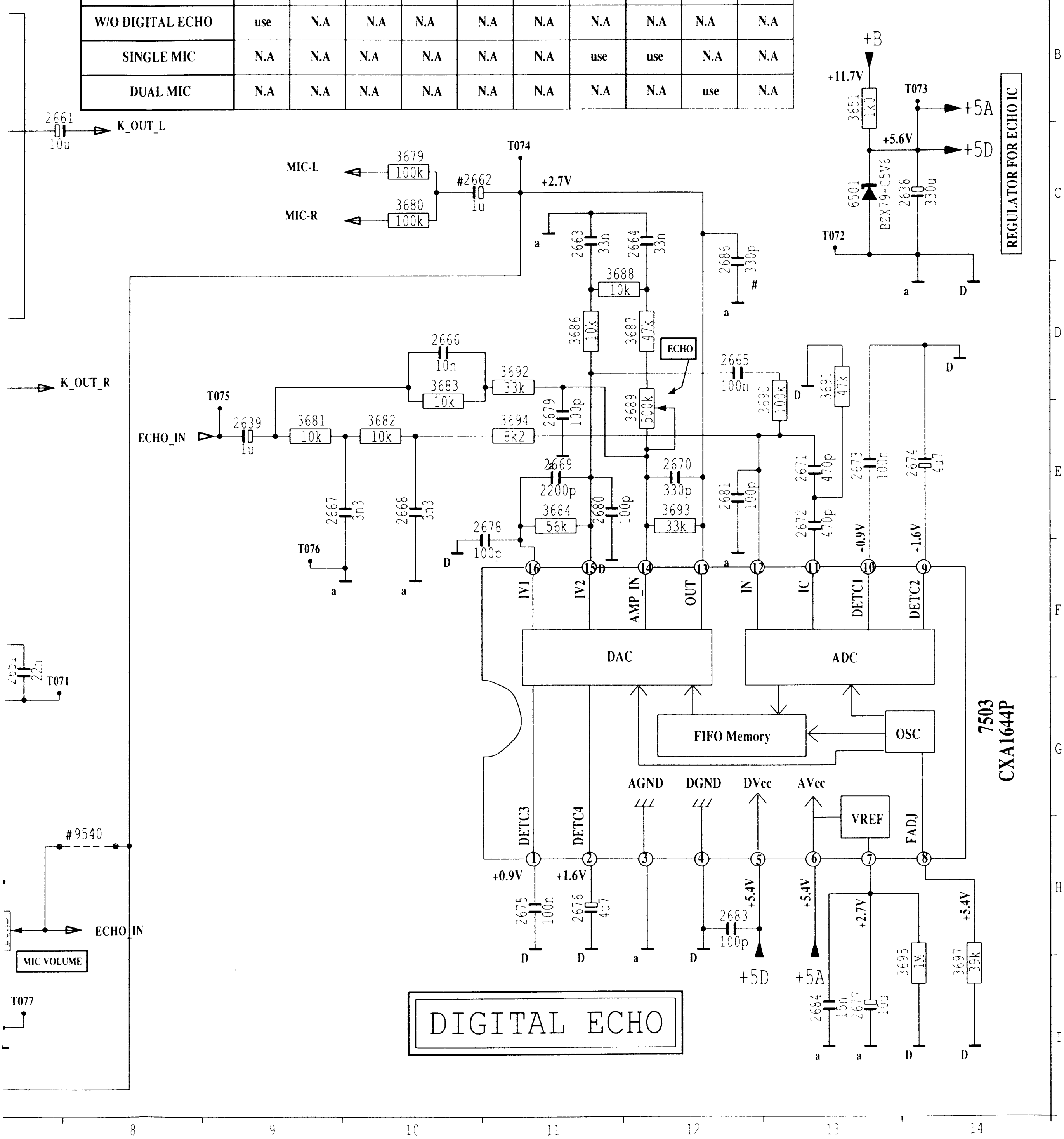
NOTE:
Table below only valid for component with '#' and '@'.

JUMPER / 12 NC	9540	9541	9542	9543	9544	9545	9546	9547	9552	@
VOCAL FADE	N.A	N.A	N.A	use	N.A	use	N.A	N.A	N.A	use
MULTIPLEXER	N.A	use	use	N.A	use	N.A	N.A	N.A	N.A	N.A
DIGITAL ECHO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
W/O DIGITAL ECHO	use	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
SINGLE MIC	N.A	N.A	N.A	N.A	N.A	N.A	use	use	N.A	N.A
DUAL MIC	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	use	N.A

use -> Applicable for this feature

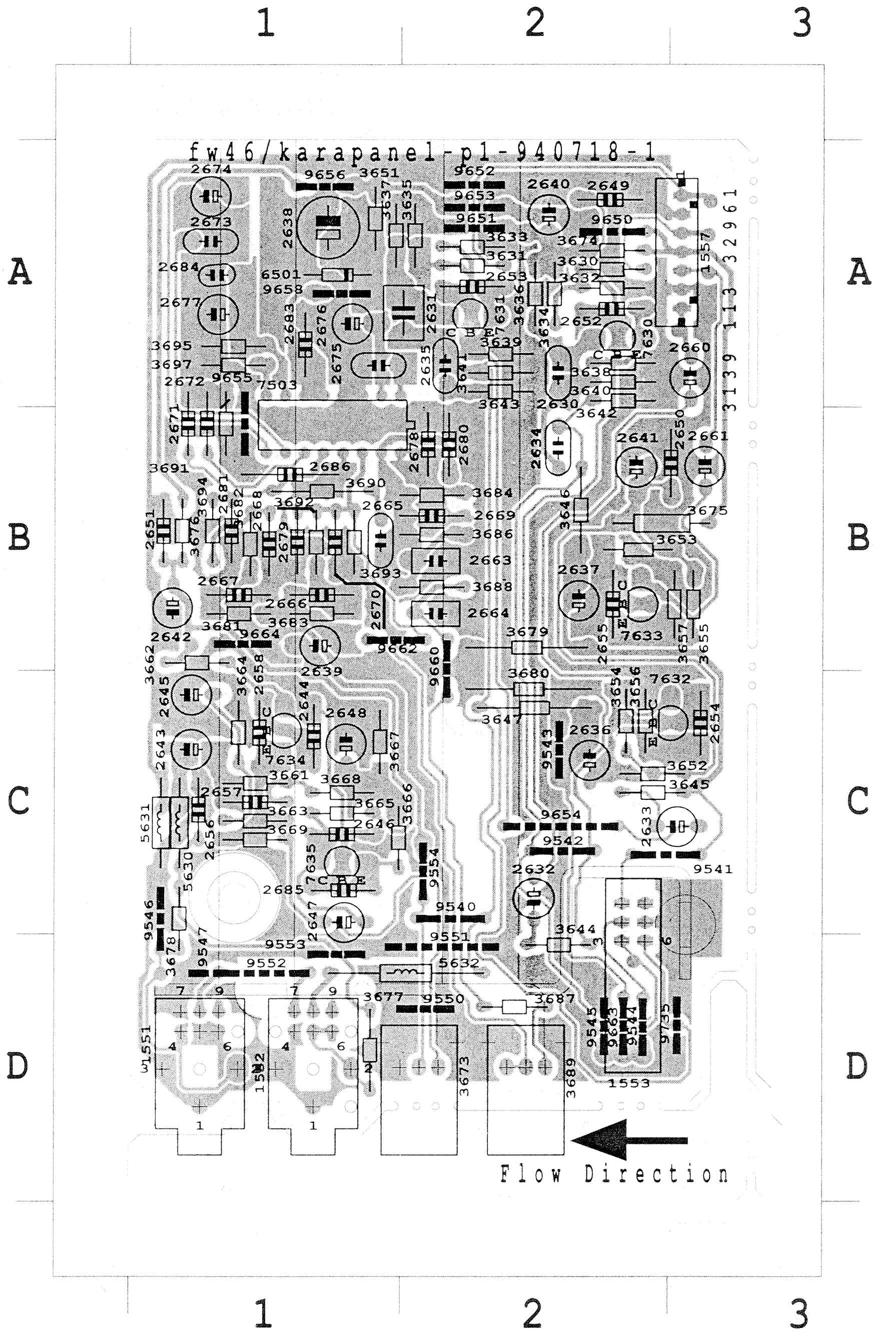
N.A -> Not Applicable

-> For provision only.


8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
+B
+11.7V
3651
1k0
T073
+5A
+5.6V
+5D
6501
BZX79-C5V6
2638
330u
T072
a
D
REGULATOR FOR ECHO IC
2661
10u
K_OUT_L
K_OUT_R
T074
MIC-L
MIC-R
3679
100k
3680
100k
#2662
1u
+2.7V
2663
33n
2664
33n
2686
330p
#
3688
10k
3686
10k
3687
47k
ECHO
2666
10n
3692
33k
3683
10k
2665
100n
3690
100k
3691
47k
T075
ECHO_IN
2639
1u
3681
10k
3682
10k
3694
8k2
2679
100p
3689
500k
2669
2200p
2670
330p
2681
100p
2671
470p
2672
470p
2673
100n
2674
4u7
2667
3n3
2668
3n3
3684
56k
2680
100p
3693
33k
2678
100p
T076
+0.9V
+1.6V
IV1
IV2
AMP_IN
OUT
IN
IC
DETC1
DETC2
DAC
ADC
FIFO Memory
OSC
7503
CXA1644P
AGND
DGND
DVcc
AVcc
VREF
DETC3
DETC4
FADJ
2675
100n
2676
4u7
2683
100p
+5.4V
+5D
+5A
+2.7V
3695
1M
3697
39k
2684
15n
2677
10u
2651
22n
T071
#9540
ECHO_IN
MIC VOLUME
T077

DIGITAL ECHO

1551	G 1
1552	E 1
1553	C 6
1557	B 1
2630	D 4
2631	B 4
2632	E 4
2633	C 4
2634	D 4
2635	B 4
2636	E 6
2637	C 5
2638	C14
2639	E 9
2640	B 4
2641	B 6
2642	F 7
2643	H 4
2644	G 5
2645	I 5
2646	G 6
2647	G 7
2648	I 7
2649	B 4
2650	B 6
2651	F 7
2652	D 2
2653	C 2
2654	E 6
2655	C 6
2656	H 3
2657	G 4
2658	H 5
2660	D 7
2661	B 7
2662	C10
2663	C11
2664	C12
2665	D12
2666	D10
2667	E 9
2668	E10
2669	E11
2670	E12
2671	E13
2672	E13
2673	E13
2674	E14
2675	H11
2676	H11
2677	I13
2678	E11
2679	E11
2680	E11
2681	E12
2683	H12
2684	I13
2685	H 6
2686	C12
3630	D 2
3631	C 2
3632	E 3
3633	C 3
3634	D 3
3635	B 3
3636	D 3
3637	B 3
3638	E 3
3639	C 3
3640	D 4
3641	B 4
3642	D 5
3643	B 5
3644	E 4
3645	C 4
3646	C 5
3647	C 5
3651	B13
3652	D 6
3653	B 6
3654	D 7
3655	B 7
3656	E 7
3657	C 7
3661	H 4
3662	G 5
3663	H 5
3664	I 5
3665	G 6
3666	H 6
3667	I 6
3668	H 6
3669	H 6
3673	H 7
3674	A 3
3675	A 7
3676	F 6
3677	F 3
3678	H 3
3679	C1
3680	C1
3681	E
3682	E1
3683	D1
3684	E1
3686	D1
3687	D1
3688	D1
3689	E1
3690	D1
3691	D1
3692	D1
3693	E1
3694	E1
3695	I1
3697	I1
5630	H
5631	I
5632	F
6501	C1
7503	G1
7630	D
7631	B
7632	E
7633	C
7634	H
7635	G
9540	H
9541	C
9542	D
9543	E
9544	D
9545	D
9546	G
9547	H
9552	H



1551	D	1
1552	D	1
1553	C	2
1557	A	3
2630	A	2
2631	A	2
2632	C	2
2633	C	3
2634	B	2
2635	A	2
2636	C	2
2637	B	2
2638	A	1
2639	B	1
2640	A	2
2641	B	2
2642	B	1
2643	C	1
2644	C	1
2645	C	1
2646	C	1
2647	C	1
2648	C	1
2649	A	2
2650	B	3
2651	B	1
2652	A	2
2653	A	2
2654	C	3
2655	B	2
2656	C	1
2657	C	1
2658	C	1
2660	A	3
2661	B	3
2663	B	2
2664	B	2
2665	B	1
2666	B	1
2667	B	1
2668	B	1
2669	B	2
2670	B	1
2671	B	1
2672	B	1
2673	A	1
2674	A	1
2675	A	1
2676	A	1
2677	A	1
2678	B	2
2679	B	1
2680	B	2
2681	B	1
2683	A	1
2684	A	1
2685	C	1
2686	B	1
3630	A	2
3631	A	2
3632	A	2
3633	A	2
3634	A	2
3635	A	2
3636	A	2
3637	A	1
3638	A	2
3639	A	2
3640	A	2
3641	A	2
3642	A	2
3643	A	2
3644	D	2
3645	C	3
3646	B	2
3647	C	2
3651	A	1
3652	C	2
3653	B	2
3654	C	2
3655	B	3
3656	C	2
3657	B	3
3658	C	2
3659	B	2
3661	C	1
3662	B	1
3663	C	1
3664	C	1
3665	C	1
3666	C	1
3667	C	1
3668	C	1
3669	C	1
3673	D	2
3674	A	2
3675	B	2
3676	B	1
3677	D	1
3678	C	1
3679	B	2
3680	C	2
3681	B	1
3682	B	1
3683	B	1
3684	B	2
3686	B	2
3687	D	2
3688	B	2
3689	D	2
3690	B	1
3691	B	1
3692	B	1
3693	B	1
3694	B	1
3695	A	1
3697	A	1
5630	C	1
5631	C	1
5632	D	2
6501	A	1
7503	B	1
7630	A	2
7631	A	2
7632	C	3
7633	B	2
7634	C	1
7635	C	1
9540	C	2
9541	C	2
9542	C	2
9543	C	2
9544	D	2
9545	D	2
9546	C	1
9547	D	1
9550	D	2
9551	D	2
9552	D	1
9553	D	1
9554	C	2
9650	A	2
9651	A	2
9652	A	2
9653	A	2
9654	C	2
9655	B	1
9656	A	1
9658	A	1
9660	B	2
9662	B	1
9663	D	2
9664	B	1
9735	D	3

KARAOKE BOARD (WITH DIGITAL ECHO)

MISCELLANEOUS

1551	4822 267 40898	Mic Socket
1552	4822 267 40898	Mic Socket
1553	4822 276 12571	Vocal Fade control

⊣⊢

2630	5322 121 42661	330nF 5% 63V
2631	5322 121 42661	330nF 5% 63V
2632	4822 124 40244	2.2µF 20% 63V
2633	4822 124 41576	2.2µF 20% 50V
2634	5322 121 42662	68nF 5% 250V
2635	5322 121 42662	68nF 5% 250V
2636	4822 124 41576	2.2µF 20% 50V
2637	4822 124 41576	2.2µF 20% 50V
2638	4822 124 22225	330µF 20% 16V
2639	4822 124 40242	1µF 20% 63V
2640	4822 124 41525	100µF 20% 25V
2641	4822 124 22225	330µF 20% 16V
2642	4822 124 41525	100µF 20% 25V
2643	4822 124 40246	4.7µF 20% 63V
2644	4822 122 33069	33pF 5% 50V
2645	4822 124 40246	4.7µF 20% 63V
2646	4822 122 33069	33pF 5% 50V
2647	4822 124 41576	2.2µF 20% 50V
2648	4822 124 40246	4.7µF 20% 63V
2649	4822 126 11585	22nF +80-20% 25V
2650	4822 126 11585	22nF +80-20% 25V
2651	4822 126 11585	22nF +80-20% 25V
2652	4822 126 12787	330pF 10% 50V
2653	4822 126 12787	330pF 10% 50V
2654	4822 122 33195	100pF 10% 50V
2655	4822 122 33195	100pF 10% 50V
2656	4822 122 33195	100pF 10% 50V
2658	4822 122 33197	1nF 10% 50V
2660	4822 124 41576	2.2µF 20% 50V
2661	4822 124 41576	2.2µF 20% 50V
2663	5322 121 42489	33nF 5% 250V
2664	5322 121 42489	33nF 5% 250V
2665	5322 121 42386	100nF 5% 63V
2666	4822 121 51387	10nF 20% 16V
2667	4822 122 10577	3.3nF 10% 16V
2668	4822 122 10577	3.3nF 10% 16V
2669	4822 126 12339	2.2nF 10%
2670	4822 126 12787	330pF 10% 50V
2671	4822 122 33519	470pF 10% 50V
2672	4822 122 33519	470pF 10% 50V
2673	5322 121 42386	100nF 5% 63V
2674	4822 124 40246	4.7µF 20% 63V
2675	5322 121 42386	100nF 5% 63V
2676	4822 124 40246	4.7µF 20% 63V
2677	4822 124 41525	100µF 20% 25V
2678	4822 122 33195	100pF 10% 50V

⊣⊢

2679	4822 122 33195	100pF 10% 50V
2680	4822 122 33195	100pF 10% 50V
2681	4822 122 33195	100pF 10% 50V
2683	4822 126 11585	22nF +80-20% 25V
2684	4822 126 11585	22nF +80-20% 25V
2685	4822 122 33195	100pF 10% 50V

⊣▭⊢

3630	4822 116 52251	18k 5% 0.5W
3631	4822 116 52251	18k 5% 0.5W
3632	4822 116 52234	100k 5% 0.5W
3633	4822 116 52234	100k 5% 0.5W
3634	4822 116 52265	270k 5% 0.5W
3635	4822 116 52265	270k 5% 0.5W
3636	4822 116 52289	5k6 5% 0.5W
3637	4822 116 52289	5k6 5% 0.5W
3638	4822 116 52263	2k7 5% 0.5W
3639	4822 116 52263	2k7 5% 0.5W
3640	4822 116 52303	8k2 5% 0.5W
3641	4822 116 52303	8k2 5% 0.5W
3642	4822 116 52244	15k 5% 0.5W
3643	4822 116 52244	15k 5% 0.5W
3644	4822 116 52234	100k 5% 0.5W
3645	4822 116 52234	100k 5% 0.5W
3646	4822 116 52234	100k 5% 0.5W
3647	4822 116 52234	100k 5% 0.5W
3651	4822 050 11002	1k 1% 0.4W
3652	4822 116 81682	2M2 5% 0.5W
3653	4822 116 81682	2M2 5% 0.5W
3654	4822 116 52249	1k8 5% 0.5W
3655	4822 116 52249	1k8 5% 0.5W
3656	4822 116 52219	330Ω 5% 0.5W
3657	4822 116 52219	330Ω 5% 0.5W
3658	4822 116 52175	100Ω 5% 0.5W
3659	4822 116 52175	100Ω 5% 0.5W
3661	4822 116 52207	1k2 5% 0.5W
3662	4822 116 52289	5k6 5% 0.5W
3663	4822 116 52226	560Ω 5% 0.5W
3664	4822 050 11002	1k 1% 0.4W
3665	4822 116 52269	3k3 5% 0.5W
3666	4822 116 52224	470Ω 5% 0.5W
3667	4822 116 52243	1k5 5% 0.5W
3668	4822 116 52245	150k 5% 0.5W
3669	4822 116 52258	220k 5% 0.5W
3673	4822 101 21204	Potm 20KA
3674	4822 116 52207	1k2 5% 0.5W
3675	4822 052 10471	470Ω 5% 0.33W
3676	4822 116 52207	1k2 5% 0.5W
3677	4822 116 52233	10k 5% 0.5W
3678	4822 116 52233	10k 5% 0.5W
3679	4822 116 52234	100k 5% 0.5W

⊣▭⊢

3680	4822 116 52234	100k 5% 0.5W
3681	4822 116 52233	10k 5% 0.5W
3682	4822 116 52233	10k 5% 0.5W
3683	4822 116 52257	22k 5% 0.5W
3684	4822 116 52291	56k 5% 0.5W
3686	4822 116 52233	10k 5% 0.5W
3687	4822 116 52233	10k 5% 0.5W
3688	4822 116 52233	10k 5% 0.5W
3689	4822 101 11326	Potm 500k
3690	4822 116 52234	100k 5% 0.5W
3691	4822 116 52284	47k 5% 0.5W
3692	4822 116 52271	33k 5% 0.5W
3693	4822 116 52271	33k 5% 0.5W
3694	4822 116 52303	8k2 5% 0.5W
3695	4822 116 52235	1M 5% 0.5W
3697	4822 116 52277	39k 5% 0.5W

⊣▯⊢ ∿∿∿

5630	4822 157 52286	Coil 22µH 10%
5631	4822 157 52286	Coil 22µH 10%
5632	4822 157 52286	Coil 22µH 10%

⊳|

6501	4822 130 34173	BZX79-C5V6

Ⓚ ▭

7503	4822 209 33717	CXA1644P
7630	4822 130 44246	BC549C
7631	4822 130 44246	BC549C
7632	4822 130 44246	BC549C
7633	4822 130 44246	BC549C
7634	4822 130 44246	BC549C
7635	4822 130 44246	BC549C

Note: Only the parts mentioned in this list are normal service spare parts.

3680	4822 116 52234	100k 5% 0.5W
3681	4822 116 52233	10k 5% 0.5W
3682	4822 116 52233	10k 5% 0.5W
3683	4822 116 52257	22k 5% 0.5W
3684	4822 116 52291	56k 5% 0.5W
3686	4822 116 52233	10k 5% 0.5W
3687	4822 116 52233	10k 5% 0.5W
3688	4822 116 52233	10k 5% 0.5W
3689	4822 101 11326	Potm 500k
3690	4822 116 52234	100k 5% 0.5W
3691	4822 116 52284	47k 5% 0.5W
3692	4822 116 52271	33k 5% 0.5W
3693	4822 116 52271	33k 5% 0.5W
3694	4822 116 52303	8k2 5% 0.5W
3695	4822 116 52235	1M 5% 0.5W
3697	4822 116 52277	39k 5% 0.5W

5630	4822 157 52286	Coil 22μH 10%
5631	4822 157 52286	Coil 22μH 10%
5632	4822 157 52286	Coil 22μH 10%

6501	4822 130 34173	BZX79-C5V6

7503	4822 209 33717	CXA1644P
7630	4822 130 44246	BC549C
7631	4822 130 44246	BC549C
7632	4822 130 44246	BC549C
7633	4822 130 44246	BC549C
7634	4822 130 44246	BC549C
7635	4822 130 44246	BC549C

Note: Only the parts mentioned in this list are normal service spare parts.

Service
Service
Service

Product Service Group CE Audio

Service Information

Already published informations: *A94-153 (4822 725 25133)*
A94-155 (4822 725 25138)

(GB)
To adapt the service manual the following sheets have been added/changed.

(F)
Afin de pouvoir adapter le "manual service" les feuillets suivants ont été soit modifiés, soit ajoutés.

(NL)
Voor het aanpassen van de service manual zijn de onderstaande pagina's toegevoegd/gewijzigd.

(D)
Zür anpassung des Service Manual sind die nachstehenden Seiten hinzugefügt/geändert.

(I)
Le seguenti pagine sono state cambiate/aggiunte allo scopo di adattare il Manuale di Servizio.

During production a new version of CD loader (Short Loader) was introduced from week 9431 onwards. The new sets can be recognized by serial no. RZ 01 ....
Besides the new CD board, changes are also made on the mechanical parts and other pc boards to harmonize with its introduction. The changes are as follows:

Mechanical set

Delete Pos	265	Shield
	266	Spacer 5mm
Change Pos	264 to 4822 432 93288	Cover CD door

Combi board

Delete	2259	100nF 63V	
	2261	1000µF 16V	
	6256	1N4002	
	6258	1N4002	
Change	3505	to 1k8 5% 0.5W	(4822 116 52249)
	3506	to 1k8 5% 0.5W	(4822 116 52249)
	3507	to 3k9 5% 0.5W	(4822 116 52276)
	3508	to 3k9 5% 0.5W	(4822 116 52276)

Enclosed are the new CD Loader drawings, the CD Short loader exploded view drawings and parts list for the CD part.

1994 - 08 - 30

4822 725 25143

Dismantling hints CD Short Loader

Dismantling the tray

a) Press open/close button to open the tray. If the tray doesn´t work, use a small screw driver as shown in Fig. 1 point 1 to move the tray outside. After the first centimeter it is possible to pull the tray out by hand.

b) Release two snaps and remove tray.

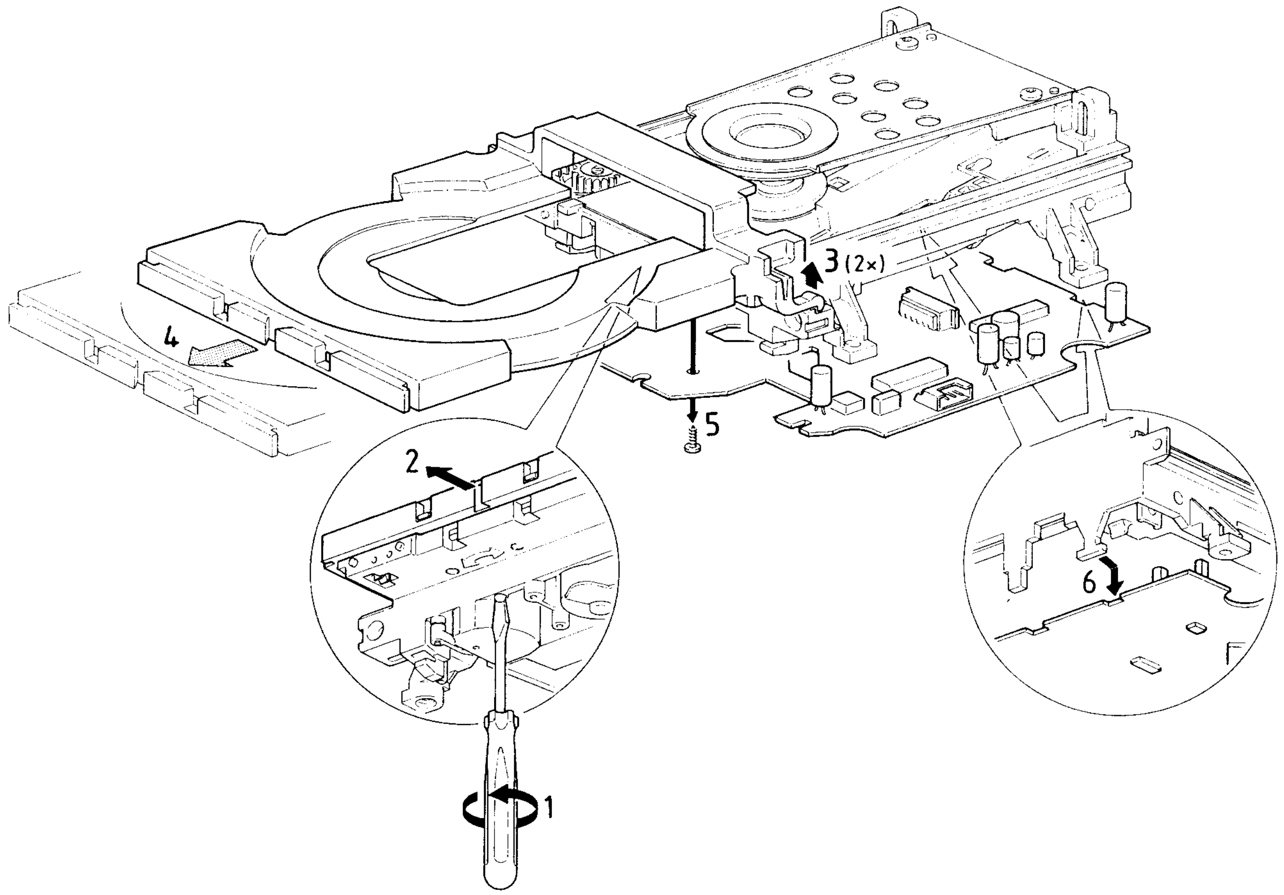


Fig. 1

Assembly of gear

a) Use a pin (e.g. a paperclip) to align th
and the gear wheel (b) together. See

b) Fix the wheels with the small plastic w

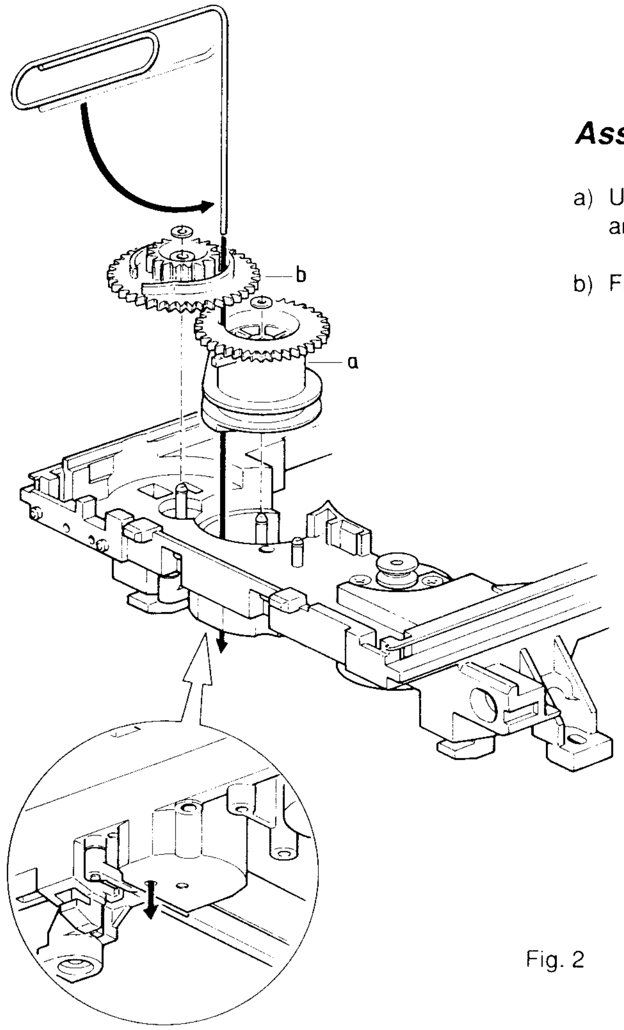


Fig. 2

Assembly of gear

a) Use a pin (e.g. a paperclip) to align the cam wheel (a) and the gear wheel (b) together. See Fig. 2.

b) Fix the wheels with the small plastic washers.

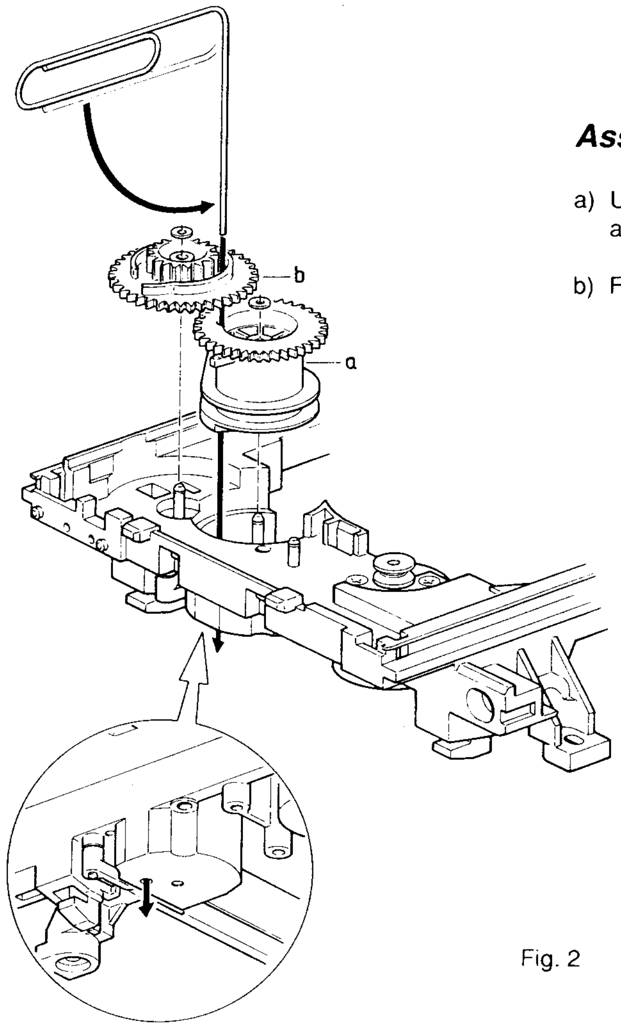


Fig. 2

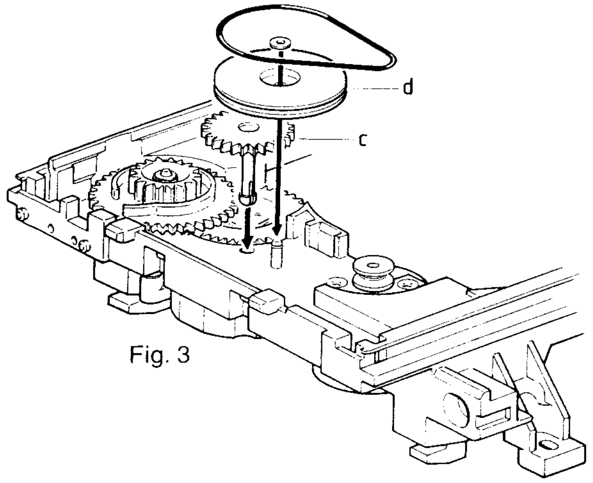


Fig. 3

c) Mount idle wheel2 (c) and idle wheel1 (d) in any position. See Fig. 3.

d) Fix the idle wheel1 with the small plastic washer.

e) Mount the driving belt.

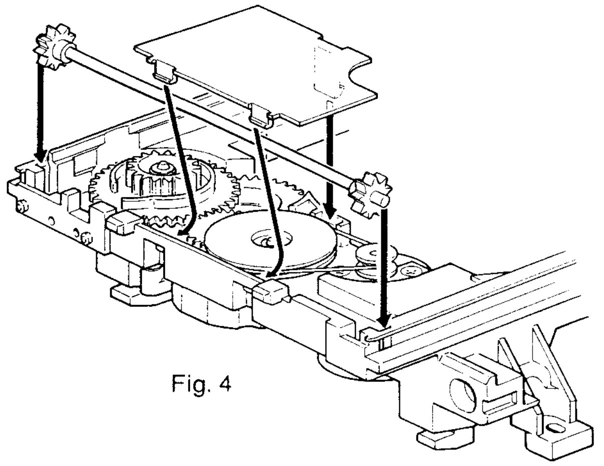


Fig. 4

f) Mount the pinion guiding assy and the cover as shown in Fig. 4.

g) Turn the gear wheel (b) counter clockwise to endposition.

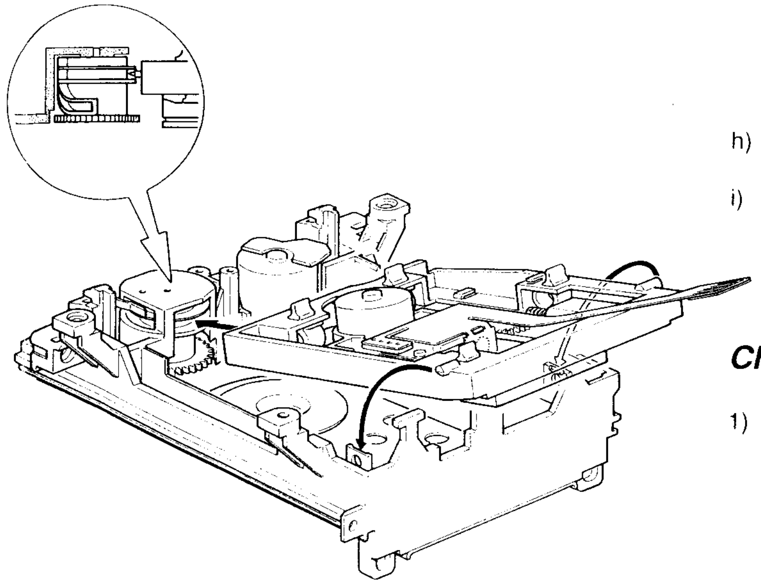


Fig. 5

h) Mount the CD Mechanism as shown in Fig. 5.

i) Mount the tray. (Align the tray to the chassis and push it inside)

Check if tray mechanism works correct!

1) Turn the gear wheel (b) clockwise to its endposition. (Use a small screwdriver as shown in Fig. 1 point 1)

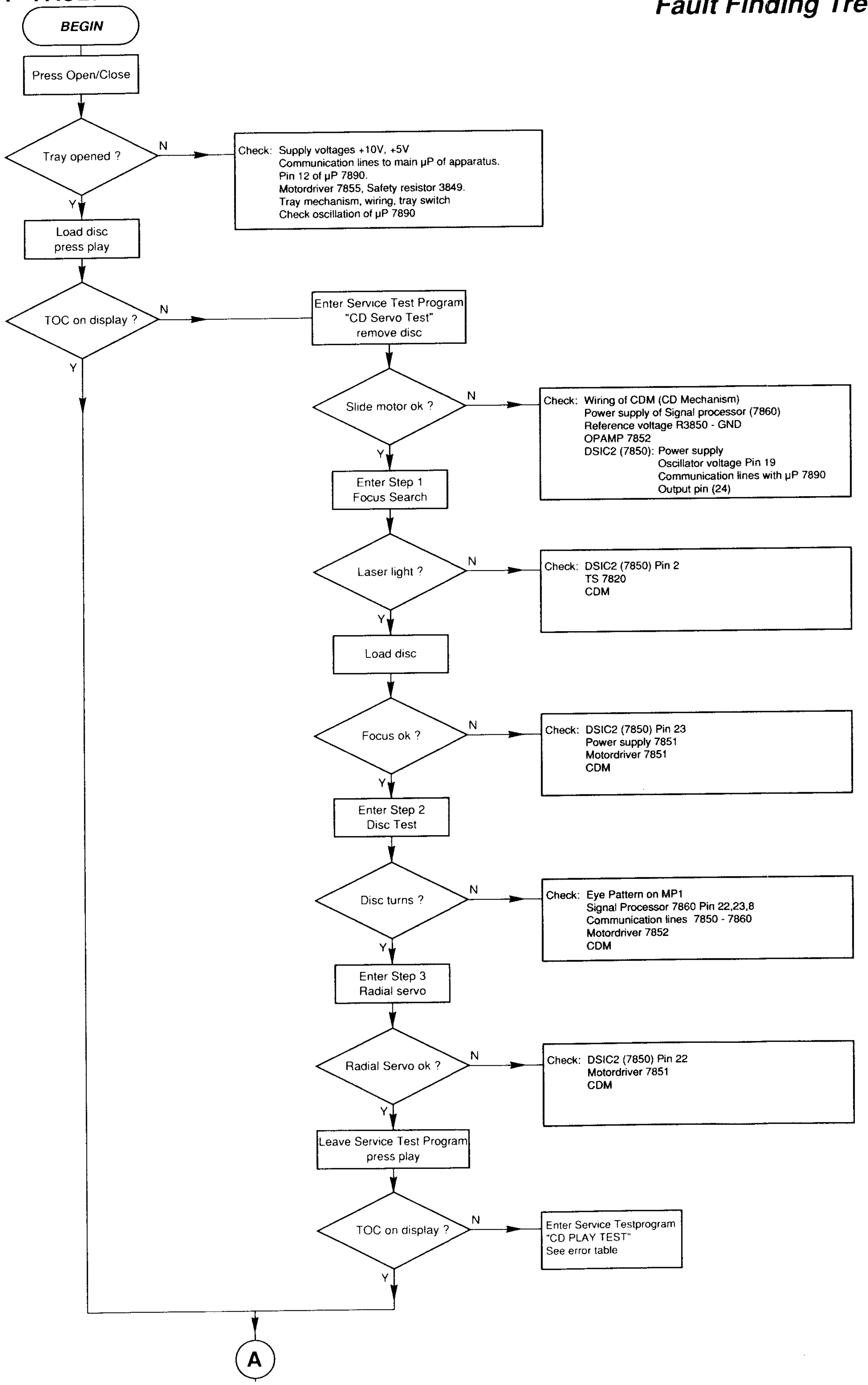
   The tray has to move to inner position first and than the CD Mechanism has to move to its upper position.

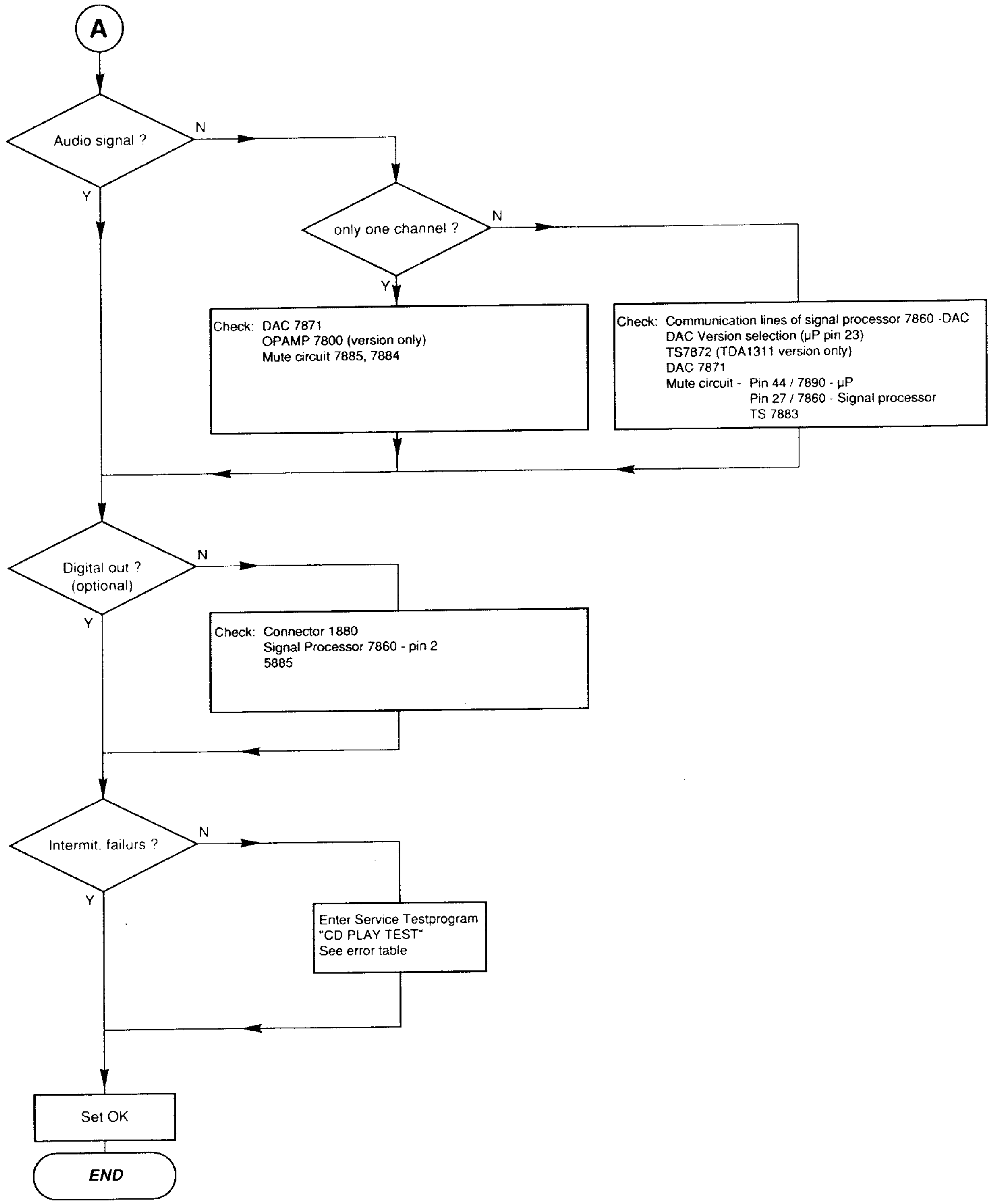
2) Turn the gear wheel (b) counter clockwise to its endposition.

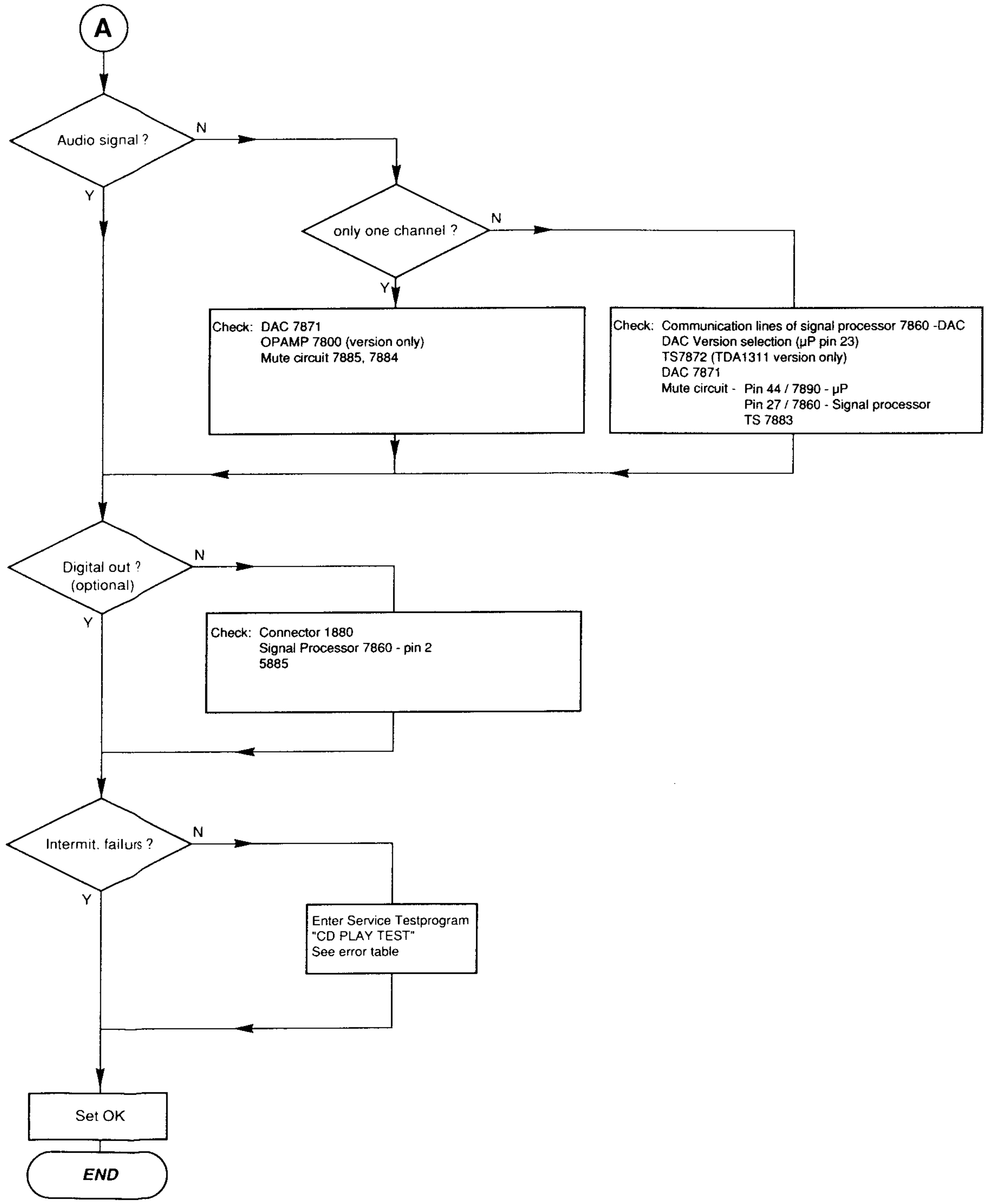
   The CD Mechanism has to move to its lower position first and than the tray has to move to outside.

CD UNIT - FAULT FINDING TREE

Fault Finding Tree CD


BEGIN
Press Open/Close
Tray opened ?
N
Y
Check: Supply voltages +10V, +5V
Communication lines to main μP of apparatus.
Pin 12 of μP 7890.
Motordriver 7855, Safety resistor 3849.
Tray mechanism, wiring, tray switch
Check oscillation of μP 7890
Load disc
press play
TOC on display ?
N
Y
Enter Service Test Program
"CD Servo Test"
remove disc
Slide motor ok ?
N
Y
Check: Wiring of CDM (CD Mechanism)
Power supply of Signal processor (7860)
Reference voltage R3850 - GND
OPAMP 7852
DSIC2 (7850): Power supply
Oscillator voltage Pin 19
Communication lines with μP 7890
Output pin (24)
Enter Step 1
Focus Search
Laser light ?
N
Y
Check: DSIC2 (7850) Pin 2
TS 7820
CDM
Load disc
Focus ok ?
N
Y
Check: DSIC2 (7850) Pin 23
Power supply 7851
Motordriver 7851
CDM
Enter Step 2
Disc Test
Disc turns ?
N
Y
Check: Eye Pattern on MP1
Signal Processor 7860 Pin 22,23,8
Communication lines 7850 - 7860
Motordriver 7852
CDM
Enter Step 3
Radial servo
Radial Servo ok ?
N
Y
Check: DSIC2 (7850) Pin 22
Motordriver 7851
CDM
Leave Service Test Program
press play
TOC on display ?
N
Y
Enter Service Testprogram
"CD PLAY TEST"
See error table
A


A
Audio signal ?
N
Y
only one channel ?
N
Y
Check: DAC 7871
OPAMP 7800 (version only)
Mute circuit 7885, 7884
Check: Communication lines of signal processor 7860 -DAC
DAC Version selection (μP pin 23)
TS7872 (TDA1311 version only)
DAC 7871
Mute circuit - Pin 44 / 7890 - μP
Pin 27 / 7860 - Signal processor
TS 7883
Digital out ?
(optional)
N
Y
Check: Connector 1880
Signal Processor 7860 - pin 2
5885
Intermit. failurs ?
N
Y
Enter Service Testprogram
"CD PLAY TEST"
See error table
Set OK
END


A
Audio signal ?
N
Y
only one channel ?
N
Y
Check: DAC 7871
OPAMP 7800 (version only)
Mute circuit 7885, 7884
Check: Communication lines of signal processor 7860 -DAC
DAC Version selection (µP pin 23)
TS7872 (TDA1311 version only)
DAC 7871
Mute circuit - Pin 44 / 7890 - µP
Pin 27 / 7860 - Signal processor
TS 7883
Digital out ?
(optional)
N
Y
Check: Connector 1880
Signal Processor 7860 - pin 2
5885
Intermit. failurs ?
N
Y
Enter Service Testprogram
"CD PLAY TEST"
See error table
Set OK
END

Abbreviations CD

DSIC2

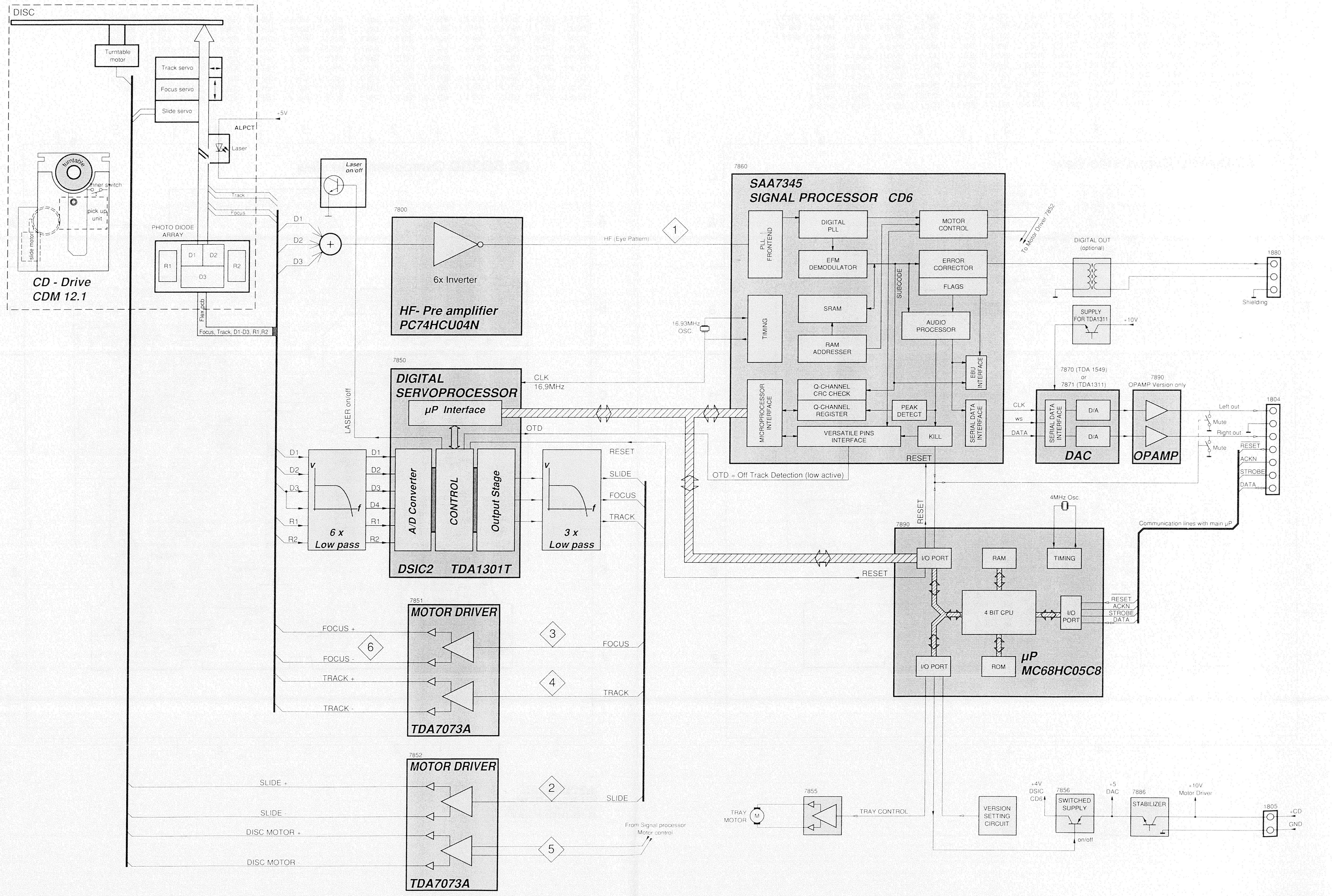
Pin	*Name*	*Direction*	*Description*
1	RESET	µP -> DSIC2	Reset input
2	Laser On/Of	DSIC -> Laser switch	Switches Laser on/off
3	Gnd	Gnd	Ground (Analog part)
4	VRH	not connected	Reference input for A/D converter
5	D1	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
6	D2	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
7	D3	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
8	Vref	Gnd	Reference input for A/D converter
9	D4	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
10	R1	Diode array -> DSIC2	Unipolar current input (Satelite diode signal input)
11	R2	Diode array -> DSIC2	Unipolar current input (Satelite diode signal input)
12	VDD		Supply for DSIC2 (Analog part)
13			
14	TS1	Gnd	Test input 1
15	TS2	Gnd	Test input 2
16	OTD	DSIC2 -> Signal Processor	Off Track Detection
17	CLO	not connected	Clock output
18	XTLO		Oscillator output
19	XTLI		Oscillator input
20	VDD		Supply for DSIC2 (Digital part)
21	Gnd		Ground (Digital part)
22	Track	DSIC2 -> Servo Driver	Radial actuator output
23	Focus	DSIC2 -> Servo Driver	Focus actuator output
24	Slide	DSIC2 -> Motor Driver	Sledge output
25	SILD	µP -> DSIC2	Serial Interface Load
26	SICL	µP -> DSIC2	Serial Interface Clock
27	SIDA	µP <-> DSIC2	Serial Interface Data
28	VDD		Supply for DSIC2 (Digital part)

SIGNAL PROCESSOR

Pin	*Name*	*Direction*	*Description*
1	CL11	not connected	11.2896MHz clock output (3-state)
2	DOMB	signal processor -> Digital out	digital bi-phase mark output (3-state)
3	V1	DSIC2 -> signal processor	versatile input pin of signal processor
4	V2	not connected	versatile input pin of signal processor
5	Test2	GND	test input of signal processor
6	Test1	GND	test input of signal processor
7	ISLICE	signal processor ->	current feedback from internal data slicer
8	HFIN	HF Pre-amp -> signal processor	comparator signal input
9	HFREF	HF Pre-amp -> signal processor	comparator signal input
10	IREF	-> signal processor	reference current pin (nom. VDD/2)
11	VDDA		supply (analog) of signal processor
12	VSSA		supply (analog) of signal processor
13	CRIN	X-Tal -> signal processor	crystal/resonator input of signal processor
14	CROUT	signal processor -> X-Tal	crystal/resonator output of signal processor
15	VDD1		supply for I/O-buffers of signal processor
16	VSS1		supply for I/O-buffers of signal processor
17	CL16	not connected	16.9344MHz clock output of signal processor
18	MISC	not connected	general purpose DAC output (3-state)
19	DATA	signal processor -> DAC	serial data output of signal processor (3-state)
20	WCLK	signal processor -> DAC	word clock output of signal processor (3-state)
21	SCLK	signal processor -> DAC	serial bit clock output of signal processor (3-state)
22	MOTOR1	signal processor -> Motor driver	motor output1 of signal processor; versatile (3-state)
23	MOTOR2	signal processor -> Motor driver	motor output2 of signal processor; versatile (3-state)
24	V5	not connected	versatile output pin of signal processor
25	V4	not connected	versatile output pin of signal processor
26	V3	not connected	versatile output pin of signal processor (open drain)
27	KILL	signal processor -> Mute circuit	kill output; programmable (open drain)
28	PORE	µP -> signal processor	power-on reset enable input (active low)
29	CLA	not connected	4.2336MHz microprocessor clock output
30	DA	µP <-> signal processor	interface data I/O-line
31	CL	µP -> signal processor	interface clock input line
32	RAB	µP -> signal processor	interface R/W and acknowledge input
33	CFLG	signal processor ->	correction flag output (open drain)
43	VSS2		digital supply for internal logic of signal processor
44	VDD2		digital supply for internal logic of signal processor

CD UNIT - BLOCK DIAGRAM

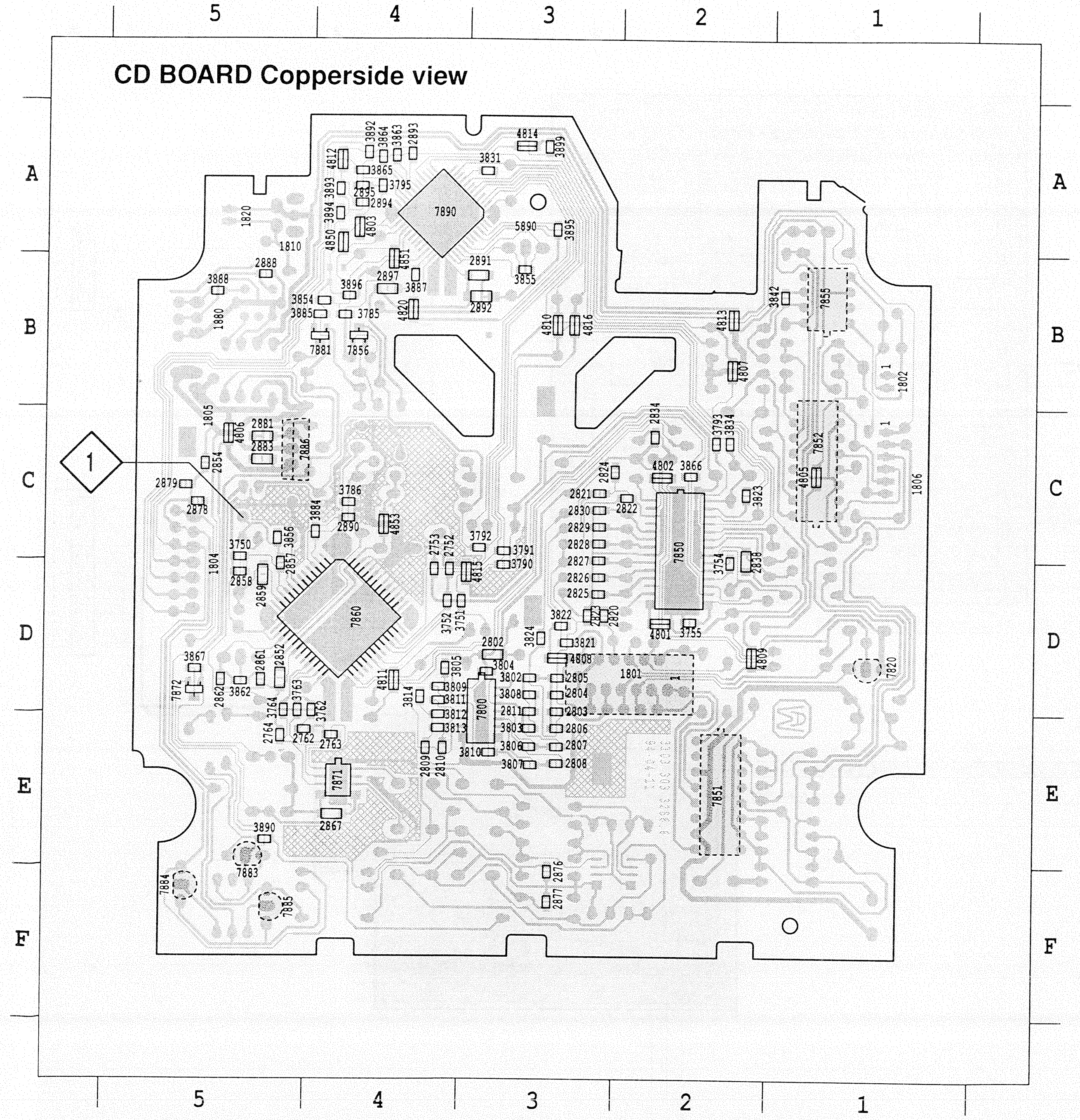
BLOCKDIAGRAM CD Module

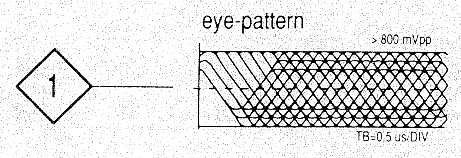

DISC
Turntable motor
Track servo
Focus servo
Slide servo
ALPCT
+5V
Laser
Laser on/off
turntable
inner switch
pick up unit
slide motor
PHOTO DIODE ARRAY
D1
D2
D3
R1
R2
CD - Drive
CDM 12.1
Flex pcb
Focus, Track, D1-D3, R1,R2
Track
Focus
7800
6x Inverter
HF- Pre amplifier
PC74HCU04N
HF (Eye Pattern)
1
7850
DIGITAL SERVOPROCESSOR
μP Interface
CLK
16.9MHz
OTD
LASER on/off
6 x Low pass
A/D Converter
CONTROL
Output Stage
DSIC2
TDA1301T
3 x Low pass
RESET
SLIDE
FOCUS
TRACK
OTD = Off Track Detection (low active)
7860
SAA7345
SIGNAL PROCESSOR CD6
PLL FRONTEND
DIGITAL PLL
MOTOR CONTROL
To Motor Driver 7852
EFM DEMODULATOR
ERROR CORRECTOR
FLAGS
SUBCODE
SRAM
TIMING
16.93MHz OSC
AUDIO PROCESSOR
RAM ADDRESSER
EBU INTERFACE
MICROPROCESSOR INTERFACE
Q-CHANNEL CRC CHECK
Q-CHANNEL REGISTER
PEAK DETECT
VERSATILE PINS INTERFACE
KILL
SERIAL DATA INTERFACE
RESET
DIGITAL OUT (optional)
1880
Shielding
SUPPLY FOR TDA1311
+10V
7870 (TDA 1549) or 7871 (TDA1311)
7890 OPAMP Version only
CLK
WS
DATA
SERIAL DATA INTERFACE
D/A
D/A
DAC
OPAMP
Left out
Mute
Right out
Mute
1804
RESET
ACKN
STROBE
DATA
4MHz Osc
Communication lines with main μP
7890
I/O PORT
RAM
TIMING
4 BIT CPU
I/O PORT
ROM
I/O PORT
μP
MC68HC05C8
RESET
ACKN
STROBE
DATA
7851
MOTOR DRIVER
FOCUS +
FOCUS -
TRACK +
TRACK -
6
3
FOCUS
4
TRACK
TDA7073A
7852
MOTOR DRIVER
SLIDE +
SLIDE -
DISC MOTOR +
DISC MOTOR -
2
SLIDE
5
From Signal processor Motor control
TDA7073A
TRAY MOTOR
M
7855
TRAY CONTROL
VERSION SETTING CIRCUIT
+4V DSIC CD6
7856
SWITCHED SUPPLY
on/off
+5 DAC
7886
STABILIZER
+10V Motor Driver
1805
+CD
GND

PC BOARD LAYOUTS

MP1 C 5	2806 E 3	2824 C 3	2854 C 5	2879 C 5	2897 B 4	3786 C 4	3805 D 4	3821 D 3	3862 D 5	3890 E 5	4803 A 4	4815 D 3	7872 D 5
2752 D 4	2807 E 3	2825 D 3	2857 D 5	2881 C 5	3750 C 5	3790 D 3	3806 E 3	3822 D 3	3863 A 4	3892 A 4	4805 C 1	4816 B 3	7881 B 4
2753 D 4	2808 E 3	2826 D 3	2858 D 5	2883 C 5	3751 D 4	3791 C 3	3807 E 3	3823 C 2	3864 A 4	3893 A 4	4806 C 5	4820 B 4	7890 A 4
2762 E 5	2809 E 4	2827 D 3	2859 D 5	2888 B 5	3752 D 4	3792 C 3	3808 D 3	3824 D 3	3865 A 4	3894 A 4	4808 D 3	4850 A 4	
2763 E 4	2810 E 4	2828 C 3	2861 D 5	2890 C 4	3754 D 2	3793 C 2	3809 D 4	3831 A 3	3866 C 2	3895 A 3	4809 D 2	4851 B 4	
2764 E 5	2811 D 3	2829 C 3	2862 D 5	2891 B 3	3755 D 2	3794 B 4	3810 E 3	3834 C 2	3867 D 5	3896 B 4	4810 B 3	7800 D 3	
2802 D 3	2820 D 3	2830 C 3	2867 E 4	2892 B 3	3762 D 4	3795 A 4	3811 D 4	3842 B 1	3884 C 4	3897 B 4	4811 D 4	7850 C 2	
2803 D 3	2821 C 3	2834 C 2	2876 F 3	2893 A 4	3763 D 5	3802 D 3	3812 E 4	3854 B 4	3885 B 4	3899 A 3	4812 A 4	7856 B 4	
2804 D 3	2822 C 2	2838 C 2	2877 F 3	2894 A 4	3764 D 5	3803 E 3	3813 E 4	3855 B 3	3887 B 4	4801 D 2	4813 B 2	7860 D 4	
2805 D 3	2823 D 3	2852 D 5	2878 C 5	2895 A 4	3785 B 4	3804 D 3	3814 D 4	3856 C 5	3888 B 5	4802 C 2	4814 A 3	7871 E 4	

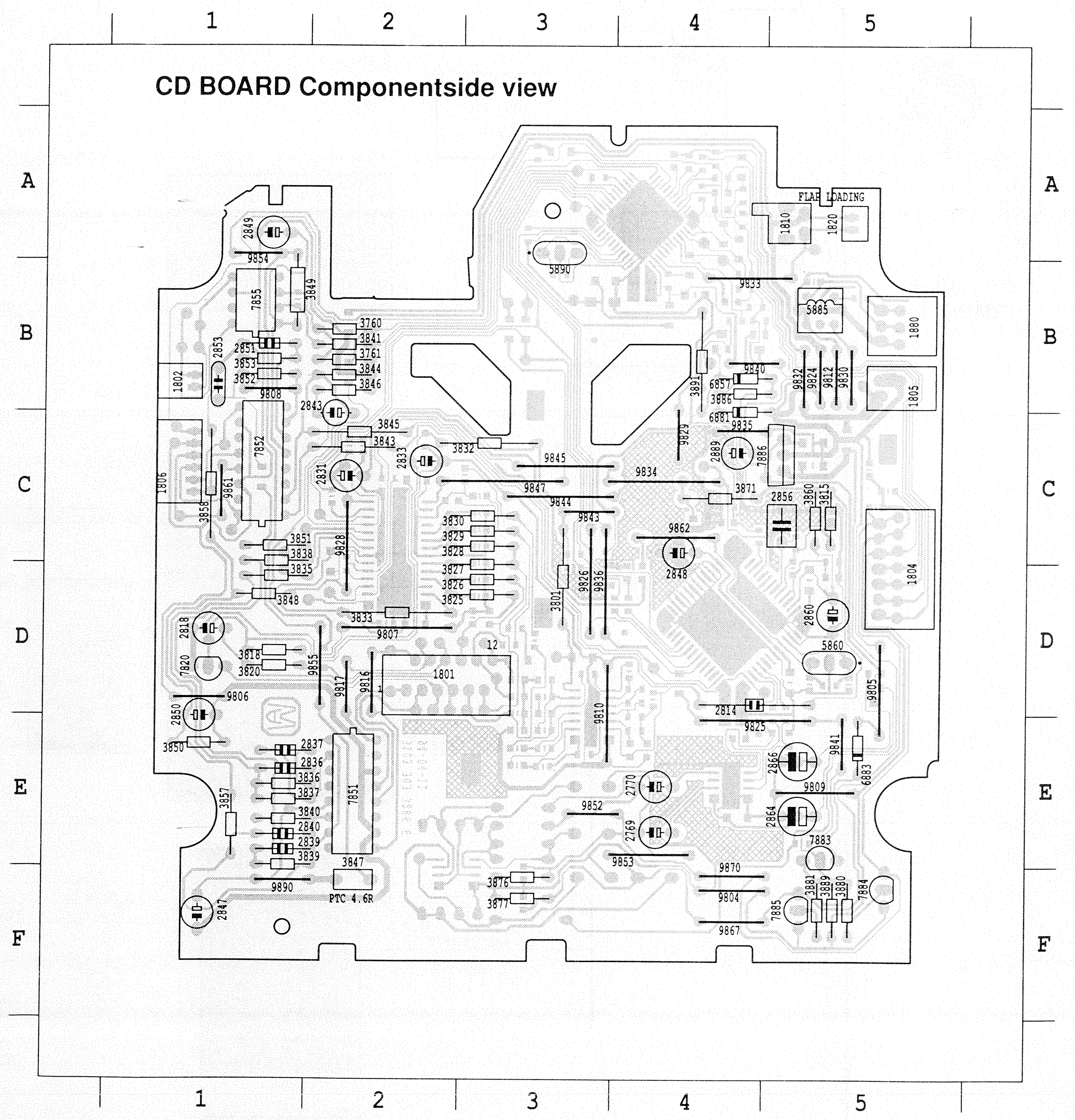
CD BOARD Copperside view





2864 E 5	1880 B 5	2839 E 1	2856 C 5	3801 D 3	3830 C 3	3841 B 2	3851 C 1	3880 F 5	6881 C 4	7886 C 5	9816 D 2	9833 B 4	9847 C 3
2866 E 5	2769 E 4	2840 E 1	2860 D 5	3815 C 5	3832 C 3	3843 C 2	3852 B 1	3881 F 5	6883 E 5	9804 F 4	9817 D 2	9834 C 4	9852 E 3
1801 D 2	2770 E 4	2843 C 2	2864 E 5	3818 D 1	3833 D 2	3844 B 2	3853 B 1	3886 B 4	7820 D 1	9805 D 5	9824 B 5	9835 C 4	9853 E 4
1802 B 1	2814 D 4	2847 F 1	2866 E 5	3820 D 1	3835 D 1	3845 C 2	3857 E 1	3889 F 5	7851 E 2	9806 D 1	9825 E 4	9836 D 3	9854 A 1
1804 D 5	2818 D 1	2848 C 4	2889 C 4	3825 D 3	3836 E 1	3846 B 2	3858 C 1	3891 B 4	7852 C 1	9807 D 2	9826 D 3	9840 B 4	9855 D 2
1805 B 5	2831 C 2	2849 A 1	3760 B 2	3826 D 3	3837 E 1	3847 F 2	3860 C 5	5860 D 5	7855 B 1	9808 B 1	9828 C 2	9841 E 5	9861 C 1
1806 C 1	2833 C 2	2850 E 1	3761 B 2	3827 D 3	3838 C 1	3848 D 1	3871 C 4	5885 B 5	7883 E 5	9809 E 5	9829 C 4	9843 C 3	9862 C 4
1810 A 5	2836 E 1	2851 B 1	3767 F 4	3828 C 3	3839 E 1	3849 B 1	3876 F 3	5890 A 3	7884 F 5	9810 D 3	9830 B 5	9844 C 3	9890 F 1
1820 A 5	2837 E 1	2853 B 1	3770 F 4	3829 C 3	3840 E 1	3850 E 1	3877 F 3	6857 B 4	7885 F 5	9812 B 5	9832 B 5	9845 C 3	

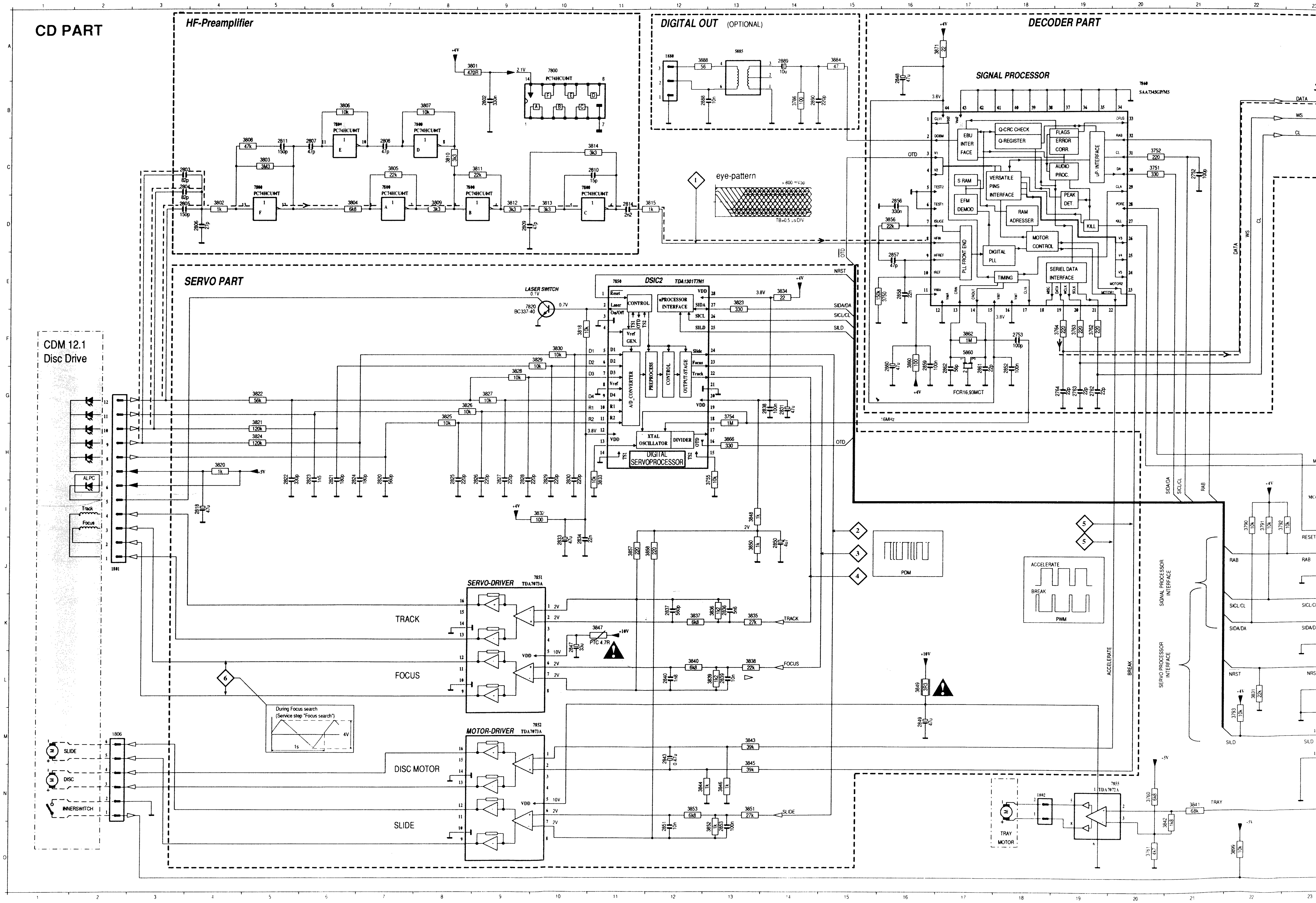
CD BOARD Componentside view



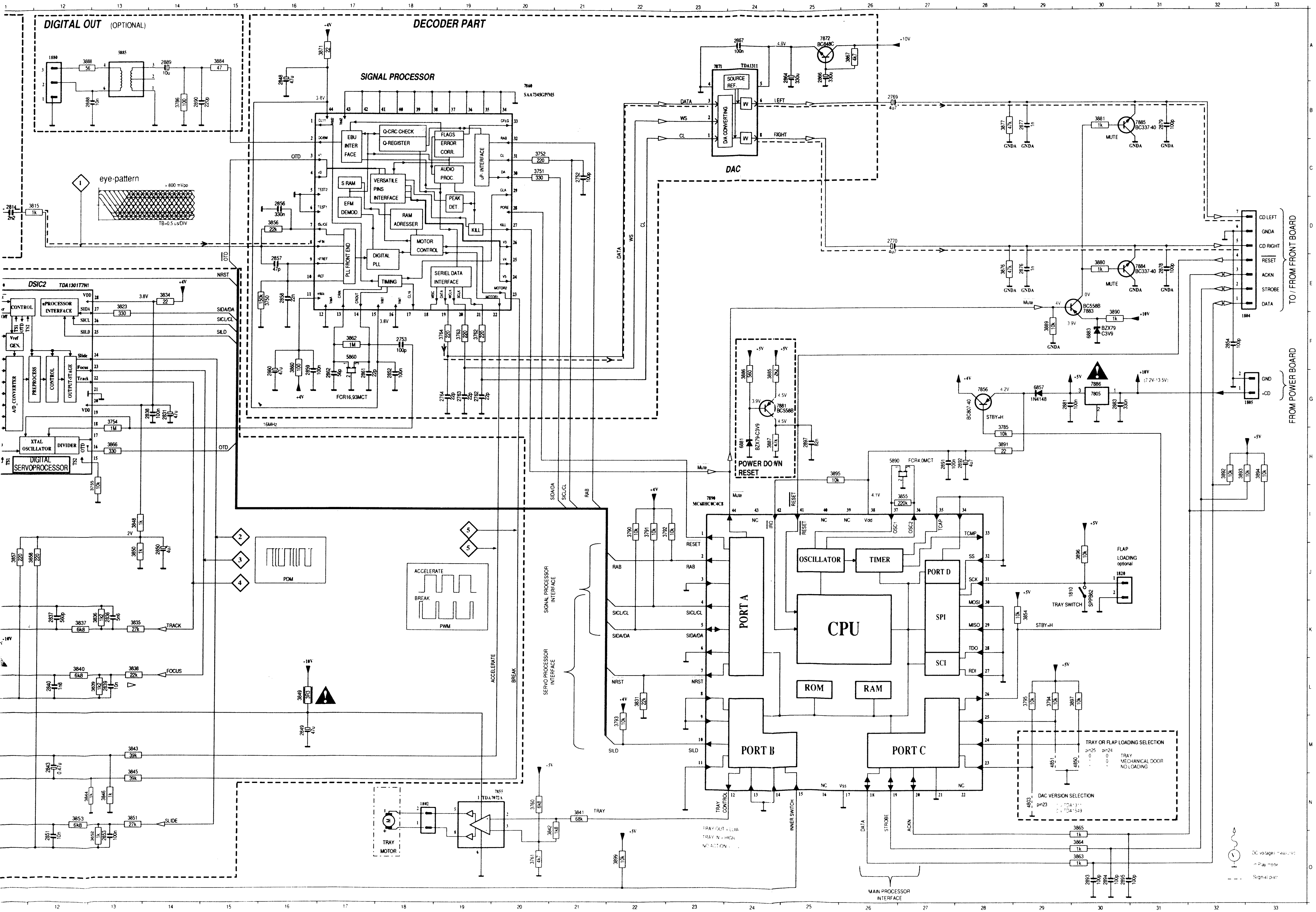
ATTENTION:
WIRE-BRIDGE 9804,9824
AND 9829 MUST BE CONNECT
ON THE SHIELDINGGROUND!

CD CIRCUIT

1801	J2	1806	O2	2752	C21	2764	G19	2803	C3	2807	C6	2811	C5	2821	H6	2825	H8	2829	H10	2834	J10	2839	L13	2848	A16	2852	G18	2857	E16	2861	G17	2867	A24	2879	B31	2889	A14	2893	O3
1802	N18	1810	J30	2753	F18	2769	B26	2804	C3	2808	C7	2814	D11	2822	H5	2826	H9	2830	H10	2836	K13	2840	L12	2849	M16	2853	O13	2858	E16	2862	G17	2876	E29	2881	G29	2890	B14	2894	O3
1804	F32	1820	J30	2762	G19	2770	D26	2805	D3	2809	D9	2818	I4	2823	H6	2827	H9	2831	H14	2837	K12	2843	M12	2850	J14	2854	F32	2859	F16	2864	A25	2877	B29	2883	G30	2891	H27	2895	O3
1805	G32	1880	A12	2763	G19	2802	B9	2806	D4	2810	C11	2820	H7	2824	H6	2828	H9	2833	J10	2838	H14	2847	L10	2851	O12	2856	D16	2860	F16	2866	A25	2878	E31	2888	B12	2892	H28	2897	H2

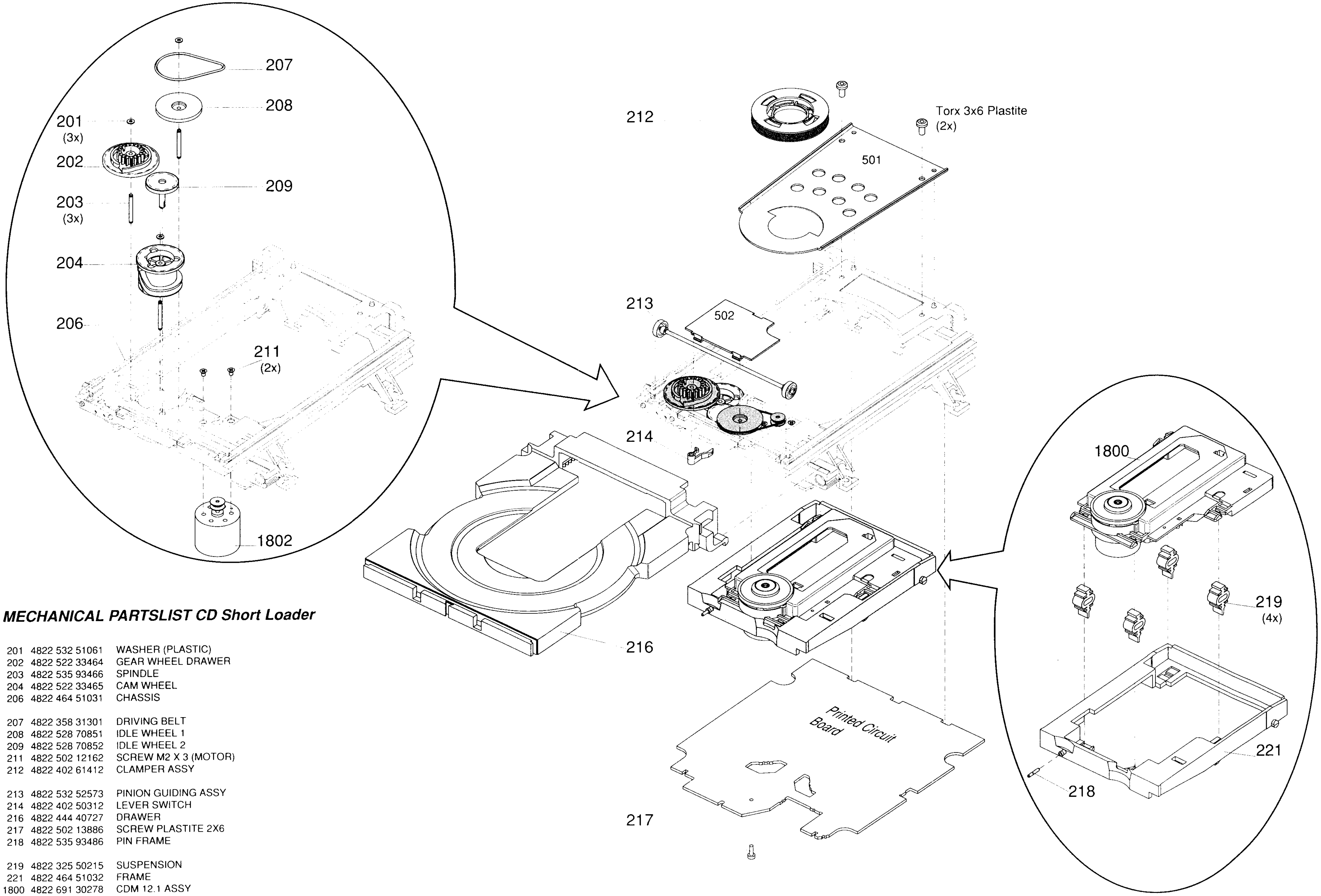

CD PART
HF-Preamplifier
DIGITAL OUT (OPTIONAL)
DECODER PART
SIGNAL PROCESSOR
7860
SAA7345GP/M5
EBU INTER FACE
Q-CRC CHECK
Q-REGISTER
FLAGS
ERROR CORR.
AUDIO PROC.
uP- INTERFACE
S RAM
EFM DEMOD.
VERSATILE PINS INTERFACE
PEAK DET.
RAM ADRESSER
KILL
MOTOR CONTROL
DIGITAL PLL
PLL FRONT END
TIMING
SERIEL DATA INTERFACE
FCR16,93MCT
DATA
WS
CL
eye-pattern
TB=0.5 us/DIV
SERVO PART
LASER SWITCH
7820 BC337-40
7850
DSIC2
TDA1301T7N1
CONTROL
uPROCESSOR INTERFACE
Vref GEN.
A/D_CONVERTER
PREPROCESS
CONTROL
OUTPUT-STAGE
XTAL OSCILLATOR
DIVIDER
DIGITAL SERVOPROCESSOR
NRST
SIDA/DA
SICL/CL
SILD
OTD
16MHz
CDM 12.1
Disc Drive
ALPC
Track
Focus
1801
SERVO-DRIVER
7851 TDA7073A
TRACK
FOCUS
PTC 4.7R
During Focus search
(Service step "Focus search")
4V
1s
MOTOR-DRIVER
7852 TDA7073A
DISC MOTOR
SLIDE
1806
SLIDE
DISC
INNERSWITCH
PDM
ACCELERATE
BREAK
PWM
SIGNAL PROCESSOR INTERFACE
SERVO PROCESSOR INTERFACE
RAB
SICL/CL
SIDA/DA
NRST
SILD
RESET
TRAY MOTOR
1802
7853 TDA7073A
TRAY

	H10
	H10
	H14
	J10
2834	J10
2836	K13
2837	K12
2838	H14
2839	L13
2840	L12
2843	M12
2847	L10
2848	A16
2849	M16
2850	J14
2851	O12
2852	G18
2853	O13
2854	F32
2856	D16
2857	E16
2858	E16
2859	F16
2860	F16
2861	G17
2862	G17
2864	A25
2866	A25
2867	A24
2876	E29
2877	B29
2878	E31
2879	B31
2881	G29
2883	G30
2888	B12
2889	A14
2890	B14
2891	H27
2892	H28
2893	O30
2894	O30
2895	O30
2897	H25
3750	E16
3751	C20
3752	C20
3754	G13
3755	H13
3760	N20
3761	O20
3762	F19
3763	F19
3764	F19
3767	A29
3770	D29
3785	H28
3786	B14
3790	I22
3791	I22
3792	I22
3793	M22
3794	L29
3795	L29
3801	A8
3802	D4
3803	C5
3804	D6
3805	C7
3806	B6
3807	B8
3808	C5
3809	D8
3810	C8
3811	C9
3812	D9
3813	D10
3814	C11
3815	D12
3818	F10
3820	H4
3821	H5
3822	G5
3823	E13
3824	H5
3825	G8
3826	G8
3827	G9
3828	G9
3829	F10
3830	F10
3831	L22
3832	I10
3833	H11
3834	E14
3835	K13
3836	K13
3837	K12
3838	L13
3839	L13
3840	L12
3841	N21
3842	N21
3843	M13
3844	N12
3845	N13
3846	N13
3847	K11
3848	I13
3849	L16
3850	J13
3851	N13
3852	O13
3853	N12
3854	K29
3855	I27
3856	D16
3857	J11
3858	J12
3860	F16
3862	F17
3863	O30
3864	O30
3865	O30
3866	H13
3867	A26
3871	A16
3876	E28
3877	B28
3880	E30
3881	B30
3884	A15
3885	G24
3886	G24
3887	H24
3888	A12
3889	F29
3890	F30
3891	H28
3892	H32
3893	H32
3894	H33
3895	H25
3896	J30
3897	L30
3899	O22
4803	N29
4850	M30
4851	M29
5860	F17
5885	A13
5890	H26
6857	G29
6881	H24
6883	F30
7800	D5
7800	B7
7800	B6
7800	C10
7800	C8
7800	C7
7820	E10
7850	E11
7851	J9
7852	M9
7855	N20
7856	G28
7860	B20
7871	A23
7872	C24
7880	D27
7880	A27
7881	G24
7883	C30
7884	E31
7885	B31
7886	G30
7890	I23


DIGITAL OUT (OPTIONAL)
DECODER PART
SIGNAL PROCESSOR
SAA7345GP/M5
EBU INTERFACE
Q-CRC CHECK
Q-REGISTER
FLAGS ERROR CORR.
AUDIO PROC.
µP-INTERFACE
S RAM
VERSATILE PINS INTERFACE
EFM DEMOD.
PEAK DET
RAM ADRESSER
KILL
MOTOR CONTROL
DIGITAL PLL
PLL FRONT END
TIMING
SERIEL DATA INTERFACE
eye-pattern
TB=0.5 us/DIV
DAC
TDA1311
SOURCE REF.
D/A CONVERTING
DATA
WS
CL
LEFT
RIGHT
+10V
MUTE
GNDA
CD LEFT
GNDA
CD RIGHT
RESET
ACKN
STROBE
DATA
TO / FROM FRONT BOARD
GND
+CD
FROM POWER BOARD
DSIC2 TDA1301T/N1
CONTROL
µPROCESSOR INTERFACE
A/D CONVERTER
PREPROCESS
CONTROL
OUTPUT-STAGE
XTAL OSCILLATOR
DIVIDER
DIGITAL SERVOPROCESSOR
SIDA/DA
SICL/CL
SILD
NRST
OTD
PDM
ACCELERATE
BREAK
PWM
TRACK
FOCUS
SLIDE
POWER DOWN RESET
MC68HC05C4CE
CPU
PORT A
PORT B
PORT C
PORT D
OSCILLATOR
TIMER
SPI
SCI
ROM
RAM
SIGNAL PROCESSOR INTERFACE
SERVO PROCESSOR INTERFACE
MAIN PROCESSOR INTERFACE
TRAY MOTOR
TDA7072A
TRAY
TRAY SWITCH
FLAP LOADING optional
STBY+H
TRAY OR FLAP LOADING SELECTION
TRAY
MECHANICAL DOOR
NO LOADING
DAC VERSION SELECTION
TRAY CONTROL
INNER SWITCH
STROBE
ACKN
DC voltages measured in Play mode
Signal path

PCS 64 356

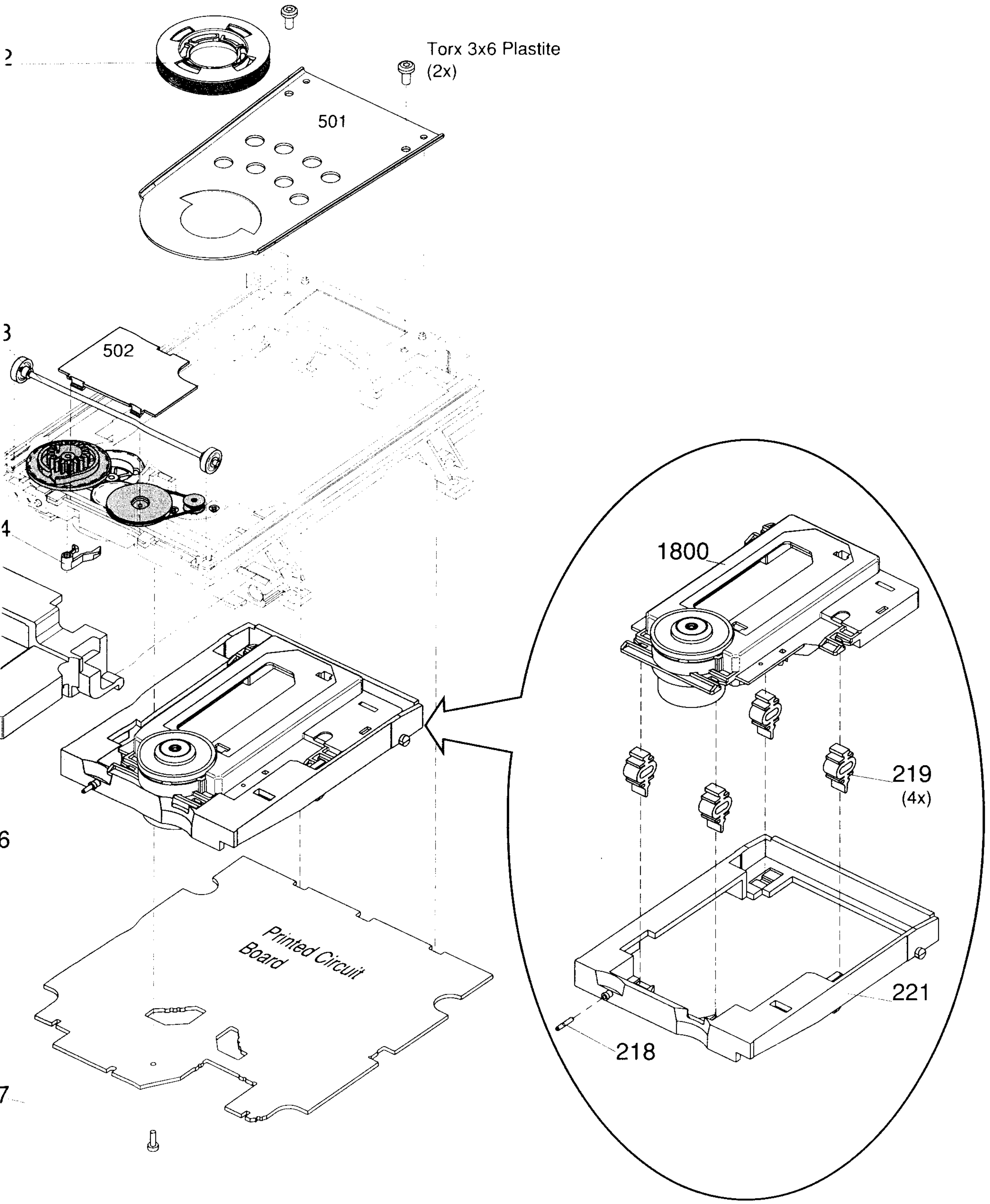
Exploded view CD Short Loader


207
208
201
(3x)
202
209
203
(3x)
204
206
211
(2x)
1802
212
Torx 3x6 Plastite
(2x)
501
213
502
214
216
1800
219
(4x)
221
218
217
Printed Circuit Board

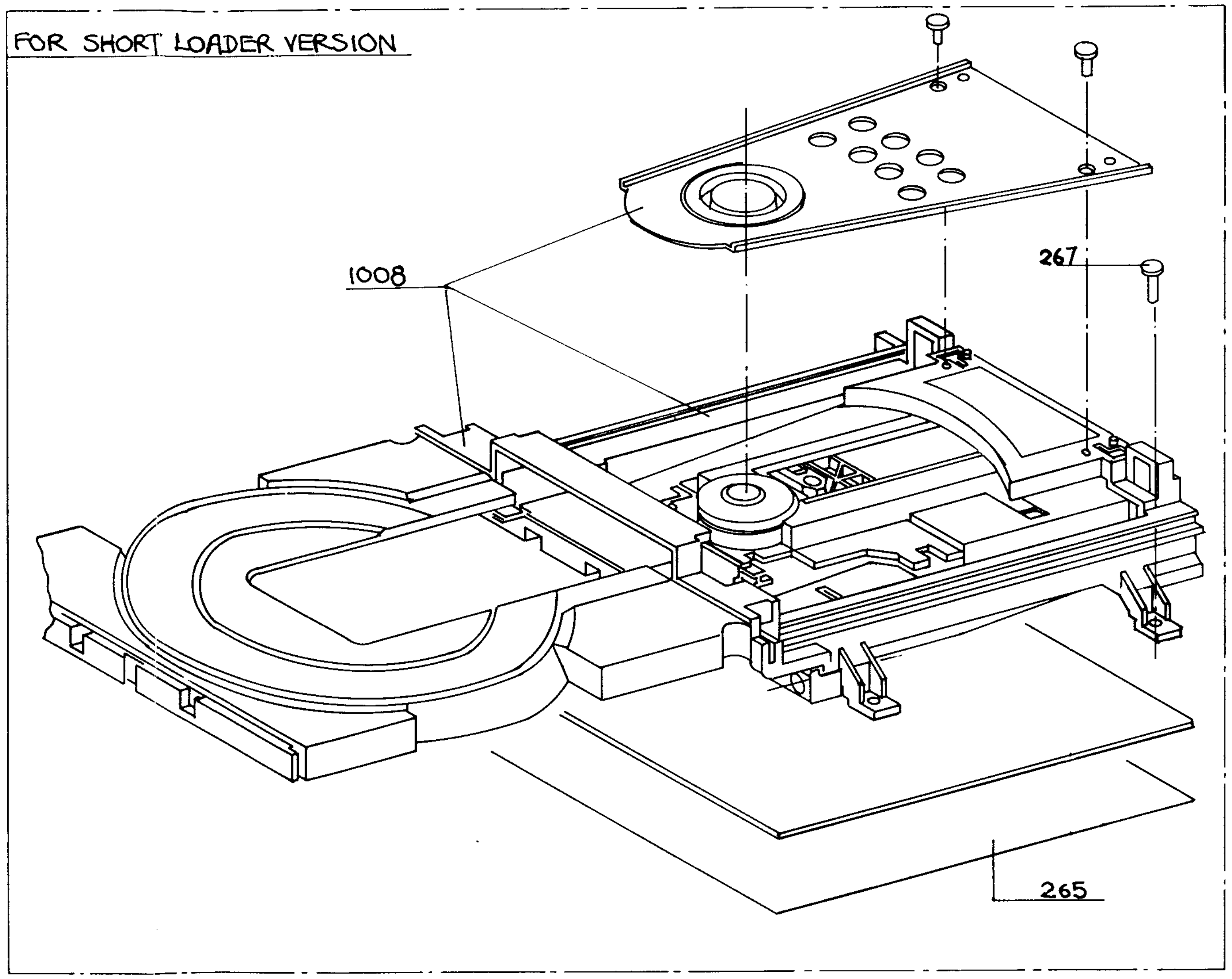
MECHANICAL PARTSLIST CD Short Loader

201	4822 532 51061	WASHER (PLASTIC)
202	4822 522 33464	GEAR WHEEL DRAWER
203	4822 535 93466	SPINDLE
204	4822 522 33465	CAM WHEEL
206	4822 464 51031	CHASSIS
207	4822 358 31301	DRIVING BELT
208	4822 528 70851	IDLE WHEEL 1
209	4822 528 70852	IDLE WHEEL 2
211	4822 502 12162	SCREW M2 X 3 (MOTOR)
212	4822 402 61412	CLAMPER ASSY
213	4822 532 52573	PINION GUIDING ASSY
214	4822 402 50312	LEVER SWITCH
216	4822 444 40727	DRAWER
217	4822 502 13886	SCREW PLASTITE 2X6
218	4822 535 93486	PIN FRAME
219	4822 325 50215	SUSPENSION
221	4822 464 51032	FRAME
1800	4822 691 30278	CDM 12.1 ASSY
1802	4822 361 21708	MOTOR ASSY
	4822 502 30735	SCREW 3 X 6 PLASTITE

Loader


2
Torx 3x6 Plastite
(2x)
501
3
502
4
6
7
Printed Circuit Board
1800
219
(4x)
221
218

SHORT LOADER MOUNTING (CENTRE UNIT)


FOR SHORT LOADER VERSION
1008
267
265

CD PART

MISCELLANEOUS

1810	4822 276 13503	Switch

⊣⊢

2752	5322 122 32531	100pF 5% 50V
2753	5322 122 32531	100pF 5% 50V
2762	5322 122 32658	22pF 5% 50V
2763	5322 122 32658	22pF 5% 50V
2764	5322 122 32658	22pF 5% 50V
2769	4822 124 80115	4.7µF 20% 25V
2770	4822 124 80115	4.7µF 20% 25V
2802	4822 122 33064	330nF 80% 25V
2803	4822 122 33515	82pF 5% 63V
2804	4822 122 33515	82pF 5% 63V
2805	5322 122 33538	150pF 2% 63V
2806	5322 122 31946	27pF 5% 63V
2807	5322 122 32452	47pF 5% 63V
2808	5322 122 32452	47pF 5% 63V
2809	5322 122 32452	47pF 5% 63V
2810	5322 122 32481	15pF 5% 50V
2811	5322 122 33538	150pF 2% 63V
2814	4822 126 12339	2.2nF 10%
2818	4822 124 80483	47µF 20% 6.3V
2820	5322 116 80853	560pF 5% 63V
2821	4822 126 10326	180pF 5% 63V
2822	5322 122 31863	330pF 5% 50V
2823	5322 122 31865	1.5nF 10% 63V
2824	4822 126 10326	180pF 5% 63V
2825	4822 122 33575	220pF 5% 50V
2826	4822 122 33575	220pF 5% 50V
2827	4822 122 33575	220pF 5% 50V
2828	4822 122 33575	220pF 5% 50V
2829	4822 122 33575	220pF 5% 50V
2830	4822 122 33575	220pF 5% 50V
2831	4822 124 80483	47µF 20% 6.3V
2833	4822 124 80483	47µF 20% 6.3V
2834	5322 122 32654	22nF 10% 63V
2836	4822 126 13098	5.6nF 20% 16V
2837	4822 122 10459	560pF 10% 50V
2838	4822 122 33496	100nF 10% 63V
2839	4822 121 51387	10nF 20% 16V
2840	4822 122 10576	1.8nF 10% 16V
2843	5322 124 41948	470nF 20% 50V
2847	4822 124 80934	33µF 20% 25V
2848	4822 124 80483	47µF 20% 6.3V
2849	4822 124 40433	47µF 20% 25V
2850	4822 124 80115	4.7µF 20% 25V
2851	4822 121 51387	10nF 20% 16V
2852	4822 122 33496	100nF 10% 63V
2853	5322 121 42386	100nF 5% 63V
2854	5322 122 32531	100pF 5% 50V
2856	5322 121 42661	330nF 5% 63V
2857	5322 122 32452	47pF 5% 63V
2858	5322 122 32654	22nF 10% 63V
2859	4822 122 33496	100nF 10% 63V
2860	4822 124 80483	47µF 20% 6.3V
2861	5322 122 32658	22pF 5% 50V
2862	5322 122 32661	56pF 5% 50V
2864	4822 124 42433	330µF 20% 6.3V
2866	4822 124 42433	330µF 20% 6.3V
2867	4822 122 33496	100nF 10% 63V
2876	5322 122 34123	1nF 10% 50V
2877	5322 122 34123	1nF 10% 50V
2878	5322 122 32531	100pF 5% 50V
2879	5322 122 32531	100pF 5% 50V
2881	4822 122 33496	100nF 10% 63V
2883	4822 122 33064	330nF 80% 25V
2891	4822 122 33496	100nF 10% 63V
2892	4822 124 11423	4.7µF 20%
2893	5322 122 32531	100pF 5% 50V
2894	5322 122 32531	100pF 5% 50V
2895	5322 122 32531	100pF 5% 50V
2897	5322 122 32838	82nF 10% 63V

-▭-

3750	4822 051 20154	150k 5% 0.1W
3751	4822 051 20331	330Ω 5% 0.1W
3752	4822 051 20221	220Ω 5% 0.1W
3754	4822 051 20105	1M 5% 0.1W
3755	4822 051 20103	10k 5% 0.1W
3760	4822 116 52296	6k8 5% 0.5W
3761	4822 116 52283	4k7 5% 0.5W
3762	4822 051 20221	220Ω 5% 0.1W
3763	4822 051 20221	220Ω 5% 0.1W
3764	4822 051 20221	220Ω 5% 0.1W
3785	4822 051 20103	10k 5% 0.1W
3790	4822 051 20103	10k 5% 0.1W
3791	4822 051 20103	10k 5% 0.1W
3792	4822 051 20103	10k 5% 0.1W
3793	4822 051 20103	10k 5% 0.1W
3794	Not applicable	
3795	4822 051 20103	10k 5% 0.1W
3801	4822 116 52224	470Ω 5% 0.5W
3802	4822 051 10102	1k 2% 0.25W
3803	4822 051 20335	3M3 5% 0.1W
3804	4822 051 20682	6k8 5% 0.1W
3805	4822 051 20223	22k 5% 0.1W
3806	4822 051 20103	10k 5% 0.1W
3807	4822 051 20103	10k 5% 0.1W
3808	4822 051 20473	47k 5% 0.1W
3809	4822 051 20332	3k3 5% 0.1W
3810	4822 051 20332	3k3 5% 0.1W
3811	4822 051 20223	22k 5% 0.1W
3812	4822 051 20332	3k3 5% 0.1W
3813	4822 051 20332	3k3 5% 0.1W
3814	4822 051 20332	3k3 5% 0.1W
3815	4822 050 11002	1k 1% 0.4W
3818	4822 116 52233	10k 5% 0.5W
3820	4822 050 11002	1k 1% 0.4W
3821	4822 051 20124	120k 5% 0.1W
3822	4822 051 20563	56k 5% 0.1W
3823	4822 051 20331	330Ω 5% 0.1W
3824	4822 051 20124	120k 5% 0.1W
3825	4822 116 52233	10k 5% 0.5W
3826	4822 116 52233	10k 5% 0.5W
3827	4822 116 52233	10k 5% 0.5W
3828	4822 116 52233	10k 5% 0.5W
3829	4822 116 52233	10k 5% 0.5W
3830	4822 116 52233	10k 5% 0.5W
3831	4822 051 20223	22k 5% 0.1W
3832	4822 116 52175	100Ω 5% 0.5W
3833	4822 116 52233	10k 5% 0.5W
3834	4822 051 20229	22Ω 5% 0.1W
3835	4822 116 52264	27k 5% 0.5W
3836	4822 116 52207	1k2 5% 0.5W
3837	4822 116 52296	6k8 5% 0.5W
3838	4822 116 52257	22k 5% 0.5W
3839	4822 116 52207	1k2 5% 0.5W
3840	4822 116 52296	6k8 5% 0.5W
3841	4822 116 52297	68k 5% 0.5W
3842	4822 051 20182	1k8 5% 0.1W
3843	4822 116 52277	39k 5% 0.5W
3844	4822 050 11002	1k 1% 0.4W
3845	4822 116 52277	39k 5% 0.5W
3846	4822 050 11002	1k 1% 0.4W
3847	4822 116 40227	4Ω6 25% 12V
3848	4822 050 11002	1k 1% 0.4W
3849	4822 052 10338	3Ω3 5% 0.33W
3850	4822 050 11002	1k 1% 0.4W
3851	4822 116 52264	27k 5% 0.5W
3852	4822 050 11002	1k 1% 0.4W
3853	4822 116 52296	6k8 5% 0.5W
3854	4822 051 20103	10k 5% 0.1W
3855	4822 051 20224	220k 5% 0.1W
3856	4822 051 20223	22k 5% 0.1W
3857	4822 116 52215	220Ω 5% 0.5W
3858	4822 116 52215	220Ω 5% 0.5W
3860	4822 116 52175	100Ω 5% 0.5W
3862	4822 051 20105	1M 5% 0.1W
3863	4822 051 10102	1k 2% 0.25W
3864	4822 051 10102	1k 2% 0.25W
3865	4822 051 10102	1k 2% 0.25W
3866	4822 051 20331	330Ω 5% 0.1W
3867	4822 051 20472	4k7 5% 0.1W
3871	4822 116 52186	22Ω 5% 0.5W
3876	4822 116 52284	47k 5% 0.5W
3877	4822 116 52284	47k 5% 0.5W
3880	4822 050 11002	1k 1% 0.4W
3881	4822 050 11002	1k 1% 0.4W
3885	4822 051 20222	2k2 5% 0.1W
3886	4822 116 52226	560Ω 5% 0.5W
3887	4822 051 20473	47k 5% 0.1W
3889	4822 116 52233	10k 5% 0.5W
3890	4822 051 10102	1k 2% 0.25W
3891	4822 116 52186	22Ω 5% 0.5W
3892	4822 051 20103	10k 5% 0.1W
3893	4822 051 20103	10k 5% 0.1W
3894	4822 051 20103	10k 5% 0.1W
3895	4822 051 20103	10k 5% 0.1W
3896	4822 051 20103	10k 5% 0.1W
3897	Not applicable	
3899	4822 051 20103	10k 5% 0.1W
4801	4822 051 10008	0Ω 5% 0.25W
4802	4822 051 10008	0Ω 5% 0.25W
4805	4822 051 10008	0Ω 5% 0.25W
4806	4822 051 10008	0Ω 5% 0.25W
4807	4822 051 10008	0Ω 5% 0.25W
4808	4822 051 10008	0Ω 5% 0.25W
4809	4822 051 10008	0Ω 5% 0.25W
4810	4822 051 10008	0Ω 5% 0.25W
4811	4822 051 10008	0Ω 5% 0.25W
4812	4822 051 10008	0Ω 5% 0.25W
4813	4822 051 10008	0Ω 5% 0.25W
4814	4822 051 10008	0Ω 5% 0.25W
4815	4822 051 10008	0Ω 5% 0.25W
4816	4822 051 10008	0Ω 5% 0.25W
4820	4822 051 10008	0Ω 5% 0.25W
4850	4822 051 10008	0Ω 5% 0.25W
4851	4822 051 10008	0Ω 5% 0.25W
4853	4822 051 10008	0Ω 5% 0.25W

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5860	4822 242 81151	X'tal 16.934MHz
5890	4822 242 72527	Resonator 4MHz

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6857	4822 130 30621	1N4148
6881	4822 130 31981	BZX79-C3V9
6883	4822 130 31981	BZX79-C3V9

7800	5322 209 11517	PC74HCU04T
7820	4822 130 41344	BC337-40
7850	4822 209 31064	TDA1301T/N1
7851	4822 209 32852	TDA7073A/N2
7852	4822 209 32852	TDA7073A/N2
7855	4822 209 31519	TDA7072A
7856	5322 130 60123	BC807-40
7860	4822 209 33339	SAA7345GP/M5
7871	4822 209 32196	TDA1311AT/N2
7872	5322 130 42136	BC848C
7881	5322 130 41983	BC858B
7883	4822 130 44197	BC558B
7884	4822 130 41344	BC337-40
7885	4822 130 41344	BC337-40
7886	5322 209 86518	MC7805CT
7001	4822 209 80891	MC7805CT
7890	4822 209 33337	MC68HC05C8FB